

FLIGHT

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM.

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EDITORIAL COMMENT.

"The Flying Machine from an Engineering Standpoint." A most valuable contribution to the science of aeronautics was made by Mr. F. W. Lanchester in a paper entitled "The Flying Machine from an Engineering Standpoint," which was read before the Institution of Civil Engineers on Tuesday last—the paper being the "James Forrest" Lecture for 1914. Owing to the pressure upon our space, it has been necessary to defer the publication of the paper until a later date, but we hope to insert the first instalment next week.

The value of the paper is not due to the fact that much new ground has been broken, although the author's able examination and treatment of Catastrophic Instability, to which he was the first to draw attention, may be regarded as coming under this heading, but he has indicated and correlated the results of experimental observation and careful study that have either already been, or are likely, in the near future, to be published. Especially is this true of his references to the forthcoming Report of the Advisory Committee for Aeronautics for 1912-13, and to Memorandum No. 96 of this Committee, which will not be included in the next Annual Report. We consider that the publication of the results of the N.P.L. tests in this manner is highly desirable, for it gives designers a lead as to what they can expect to occur

in practice, and may provide a solution of the difficulty of issuing official reports at more frequent intervals. In the Memorandum to which we refer, for example, the extreme probable values of the computed dynamic load factor under certain contingencies, such as, in gusts, when banking, when flattening out and in looping, are given, and it is much more satisfactory to have some more or less definite values assigned to the probable variation in the loading than for each designer to speculate on his own account, even though the factors given may subsequently be discovered to be as much as 20 per cent. out. And we are fully in agreement with the author when he states that "the aeronautical designer must bear clearly in mind that, in his particular case, his factor (of safety) has a double function, namely, both to give the margin of strength and durability needed under ordinary conditions of flight and to provide for abnormal conditions of stress, occasionally even almost to the theoretical limit of the strength of the structure." It is the fact that the factor of safety employed in some cases, when the "abnormal conditions" are considered, is so small that it would not be tolerated for one instant in any other branch of engineering work. Designers and constructors should endeavour to obtain such a factor of safety in every part as will be sufficient to meet any contingency, quite independent of skill or attention of the pilot—the difficulty at present is to achieve this end, but this will be overcome in time.

At the outset in his paper, Mr. Lanchester considered the path of flight of a hypothetical machine through the air, giving a diagram showing a number of phugoids of varying amplitude, and similar to those he has published in his book on Aerodionetics. He then proceeded to show that although these curves are plotted from a mathematical expression, they do actually bear a close relation to experimental observations of models and of machines in actual flight. This was followed by an examination of catastrophic stability and of the laws of resistance. Many data are given respecting the aerodynamic and direct resistance of an aerofoil of varying aspect ratio and section, from which he concludes that the tractive effort required to overcome the resistance encountered in flight need not exceed 1 in 12 to 1 in 14, that is 7 or 8 per cent., using an aspect ratio of about 6, and that values less than this are to-day reached in existing machines; while if it be found practicable to employ really high aspect ratios, the resistance coefficient may be as low as

6 per cent., or even 5 per cent. may prove to be attainable. Body resistance was then dealt with, and under the heading of total resistance it was shown diagrammatically how soon with increased flight speeds the question of body resistance becomes a disproportionate factor; but, as will be readily understood, with increasing weight and power of the machine, the effect of such body resistance may be rendered less important, since an increase in weight and power does not require a proportionately serious increase in the size of the members to which the body resistance is due. The author calls attention to an important matter in this sub division of his paper, as it illustrates the extent to which theory can anticipate the results attainable in actual practice. As far back as 1907 he tabulated the results of calculations for gliding angles as ranging for complete machines from 12° (approximately 1 in 5) to 6° (1 in 10), and the worst gliding angle recorded in the Military Trials was 1 in 5.3, while in present day practice the smaller angle is gradually being reached.

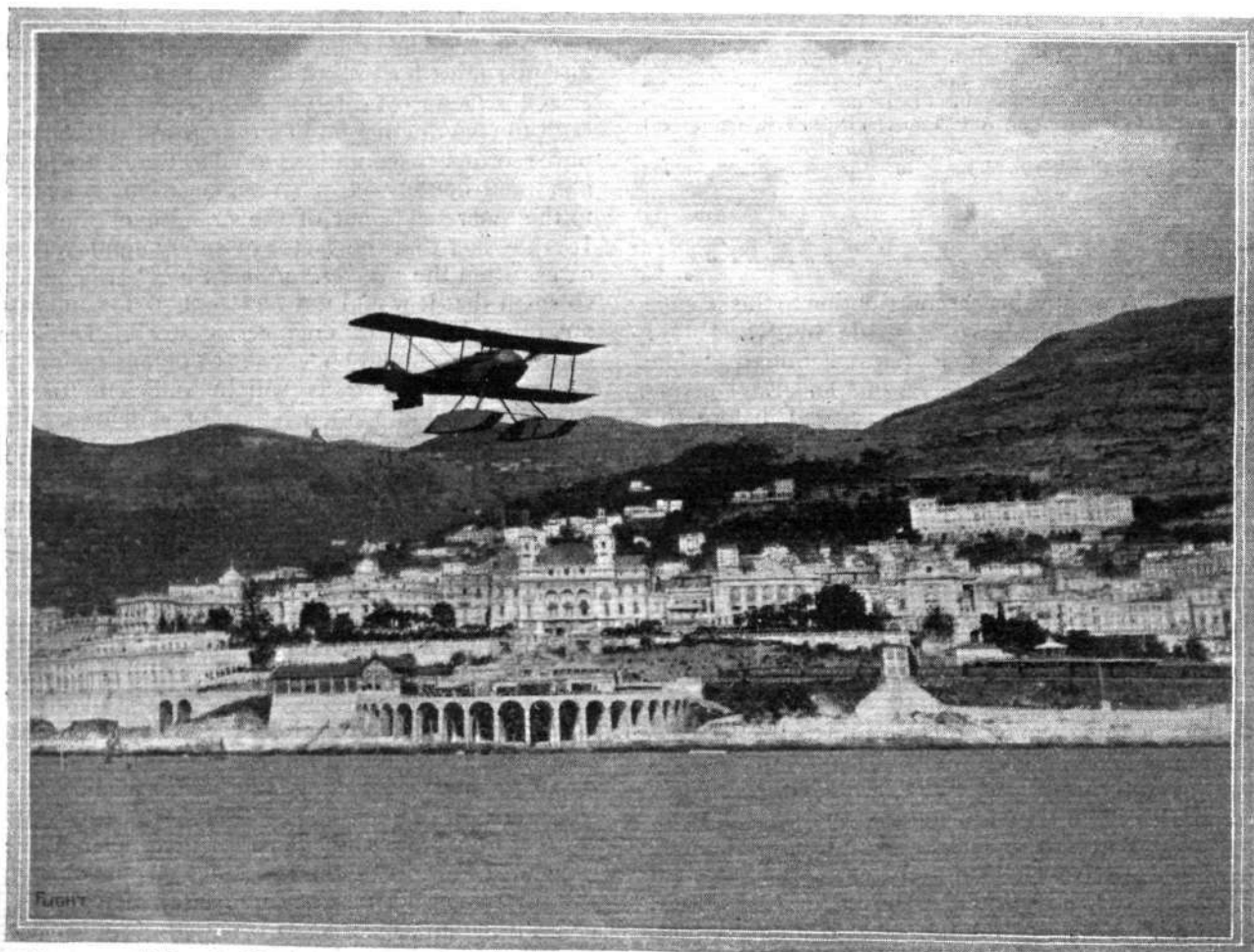
The questions of Propulsion and the Motive Power Installation next received attention, after which the design of the aerofoil and the arrangement and structural features of the machines were discussed, and two methods of calculation of stresses in the aerofoil members were outlined—one in which the aerofoil struts are treated as being pin jointed members, and the other in which the theory of continuous girders is applied to the main longitudinal. A memorandum on the latter method, which has been developed by the staff of the National Physical Laboratory and adopted by the Royal Aircraft

Factory and various manufacturers, will be included in the Advisory Committee's Report for 1912-13. This memorandum should be of value because, as the author remarks, while the pin-joint hypothesis usually gives results that are on the safe side, the extent of the factor of safety so introduced cannot be relied upon.

Reference was made to the vertical fin effect of the propeller, from which it appears that the "propeller equivalent in terms of vertical surface is a very large and serious factor, and one that under no circumstances should be ignored." This will also be published in the Advisory Committee's Report and is the result of an investigation carried out by Mr. T. W. K. Clarke.

Attention was then directed to the dynamic loading of the planes and the factor of safety that should be employed; and after various types of landing gear had been discussed, the Acentric type of machine, that is, one in which the line of propeller thrust is situated considerably above the centre of gravity and probably above the centre of resistance, and its behaviour in flight under certain conditions was considered. The paper concluded with a reference to stability and control, which is more or less merely an index to the various literature that has appeared dealing with this question, but an appendix is added relating to skin friction.

We feel confident that our readers will, when it is published in our pages, read this paper, which is copiously illustrated by diagrams, with great interest, and it should stimulate the desire for an early perusal of the forthcoming report of the Advisory Committee, which, as is now well known, will contain much valuable and useful information.



A snap of Mr. C. Howard Pixton flying the Sopwith seaplane at Monaco during his successful flight for the Schneider Cup.

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THE SCHNEIDER CUP VICTORY.—From right to left: Mr. T. O. M. Sopwith, the designer and builder of the winning seaplane; Mr. C. Howard Pixton, the pilot; and that important "accessory," the expert mechanic, Mr. Victor Mahl.

FLYING AT HENDON.

A BOMB-DROPPING competition was the principal event at Hendon last Thursday week. A circular target 100 ft. in diameter was marked out in white near the centre of the aerodrome, the "bull's eye" being indicated by a small flag. Each competitor was allowed two attempts, and the best average score was awarded the first prize. The result of this event was as follows:—

	1st Throw.	2nd Throw.	Ave- rage.
1. L. A. Strange (50 h.p. G.-W. biplane) ...	11 ft.	39½ ft.	25¼ ft.
2. R. J. Lillywhite (50 h.p. G.-W. biplane) 58 ,,	74½ ,,	64½ ,,	
3. W. Birchenough (50 h.p. G.-W. biplane) 22 ,,	146 ,,	84 ,,	
4. R. H. Carr (50 h.p. G.-W. biplane) ...	194 ,,	143 ,,	168½ ,,

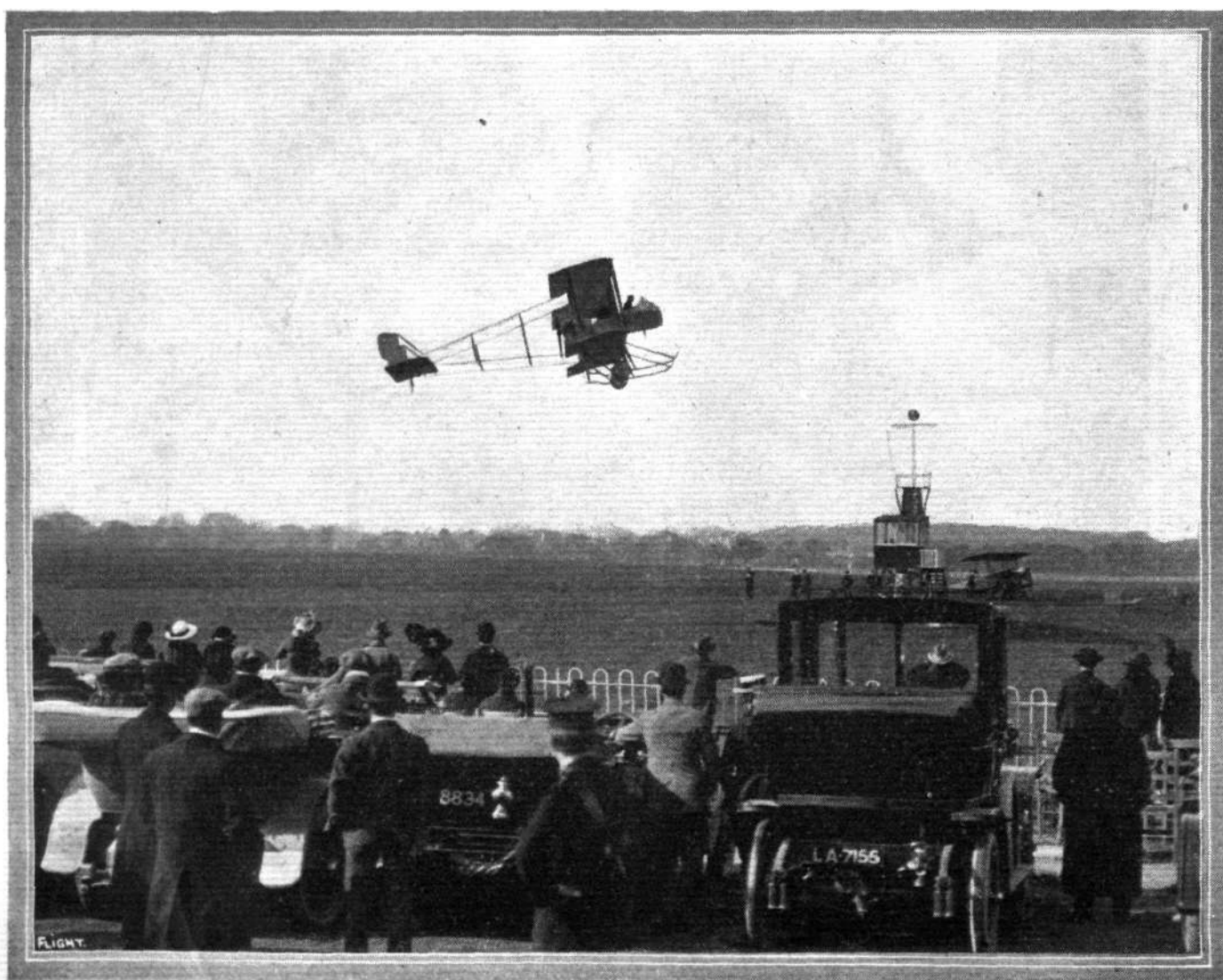
Strange's attempt, it will be seen, was remarkably good, both shots being well within the target. In addition to this event numerous exhibition and passenger flights were made throughout the afternoon. The flyers included Pierre Verrier on the Aircraft Farmans, W. Birchenough on the G.-W. bi-rudder 'bus, whilst R. H. Carr and L. A. Strange both took turns on the 50 h.p. G.-W. tractor biplane "Lizzie."

There was a gusty 30-35 m.p.h. wind blowing on Saturday afternoon last, which once again necessitated the postponement of the 12-mile speed handicap for the "Shell" Trophy—the principal event down on the programme. There was, nevertheless, a splendid afternoon's flying, R. H. Carr, F. W. Goodden, and Pierre Verrier being busy at it from 3.15 p.m. until dusk. Carr opened the proceedings with a 15-min. fight with the wind on the G.-W. tractor "Lizzie," Verrier coming out shortly after, and making two passenger flights on the new-type 70 h.p. Maurice Farman. Goodden then gave a looping demonstration on the 60 h.p. Caudron. After this Verrier made about ten more passenger flights,

on one occasion piloting one of the old-type Maurice Farmans. Carr also went up again on "Lizzie," and later in the evening Goodden gave another looping demonstration on the Caudron.

As is generally the case, Sunday's show was very good, the weather being fine and the attendance large. The proceedings opened shortly after 3 o'clock with flights by R. H. Carr on "Lizzie," W. Birchenough on the bi-rudder 'bus, and L. A. Strange with a passenger on the 80 h.p. Blériot. A little later, R. J. Lillywhite went up on the bi-rudder 'bus, and Pierre Verrier took up a passenger on the new-type Maurice Farman. Carr then made a test flight on the G.-W. five-seater aerobus, whilst Birchenough and Strange made passenger flights on the bi-rudder 'bus and the Blériot respectively.

F. W. Goodden next made a magnificent flight on the 60 h.p. Caudron, ascending to an altitude of 3,500 ft., where he flew among the clouds. In descending he executed five loops one after the other. Carr then started a regular service of passenger flights on the aerobus, which took up as many as three passengers at a time, in addition to the pilot and mechanic. About eight trips were made, Claude Grahame-White piloting the machine himself on one or two occasions. Just before 5 o'clock, M. Delaporte brought out the 80 h.p. (Salmson) Sanchez-Besa biplane, which had arrived from France via Eastchurch that morning, M. Sanchez being the passenger. Delaporte put up a wonderful exhibition, making the machine perform some very weird evolutions. Perhaps the most interesting of these was the way in which the machine turned, or rather spun round, almost within its own length, whilst another feature was the effective manner in which the brakes fitted to the main running wheels pulled the machine up on landing. On one occasion the pilot flew with his hands off the control lever, and did not hold the latter with his legs. The machine



Pierre Verrier on the "Shorthorn" Maurice Farman just starting at Hendon.

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itself is full of interesting points, but as we give a detailed description of this new arrival in this issue we will not refer any further to it here. Later in the evening Louis Noel went up on "Lizzie," and Goodden made two more very clean loops at about 1,000 ft., bringing his total number of loops to 106. At 6.30 p.m. E. Baumann made a very pretty high flight on the

40 h.p. Wright, remaining aloft for about half an hour. Just as it was getting dark, at 7.30, a Blériot suddenly came into view over the far end of the aerodrome, and making for the enclosures landed in the slip way. The late visitor turned out to be Marcel Desoutter on Lord Edward Grosvenor's 50 h.p. Blériot. Desoutter had left Brooklands shortly after 6 o'clock, but never having flown from

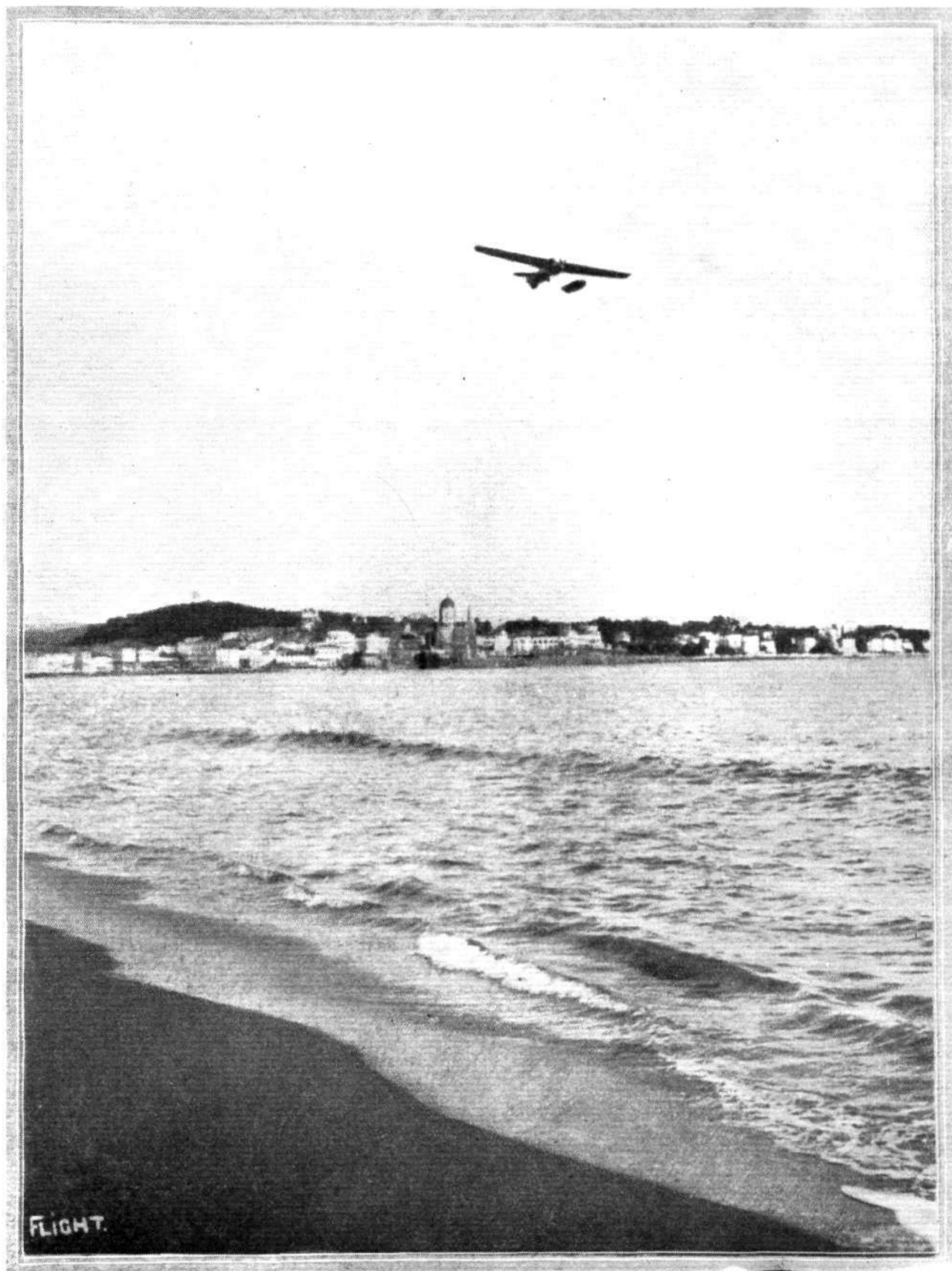


Photo by Capt. J. C. Halahan.

Seaplane flying at St. Raphael, the French Mediterranean aviation station.—Levasseur flying a Nieuport.

Brooklands to Hendon before, he had lost his way soon after leaving the former place. He had to land twice to inquire his whereabouts, and it was not until he had left Hadley Woods that he found

familiar country. He was immensely pleased to be flying again, which, thanks to the artificial leg he has made himself (only two pounds in weight), is now possible.



TO STONEHENGE.

Just an open stretch of desolate hill—
And the afterglow from the sinking sun.
Everything shadowy, quiet, and still
As the moon comes up, when the day is done.

Down in the hollows the tropical marsh,
With its tangled growth and steamy fume,
Is silent, save for occasional harsh
Weird cries that pierce the breathless gloom.

The years are old, but the world is young,
And yet there are creatures that glide on wings
Down over the hill where the moon is hung:
Vast and uncouth, but they glide upon wings.

II.

Ages have passed, it is Midsummer morn,
And there in the Temple the priests of the Sun
Are gathered to wait for the coming of dawn
And to hail the approach of the Light-giving One.

Out on the desolate side of a hill
Perfect and new stand those circles of stone.

And the priests have an innocent victim to kill
As a sacrifice to the Life-giving One.

When the sun is up, and the sacrifice made,
A bird from the sky glides down upon wings.
The birds have been since Man was made;
They are gentle and timid, but fly, with wings.

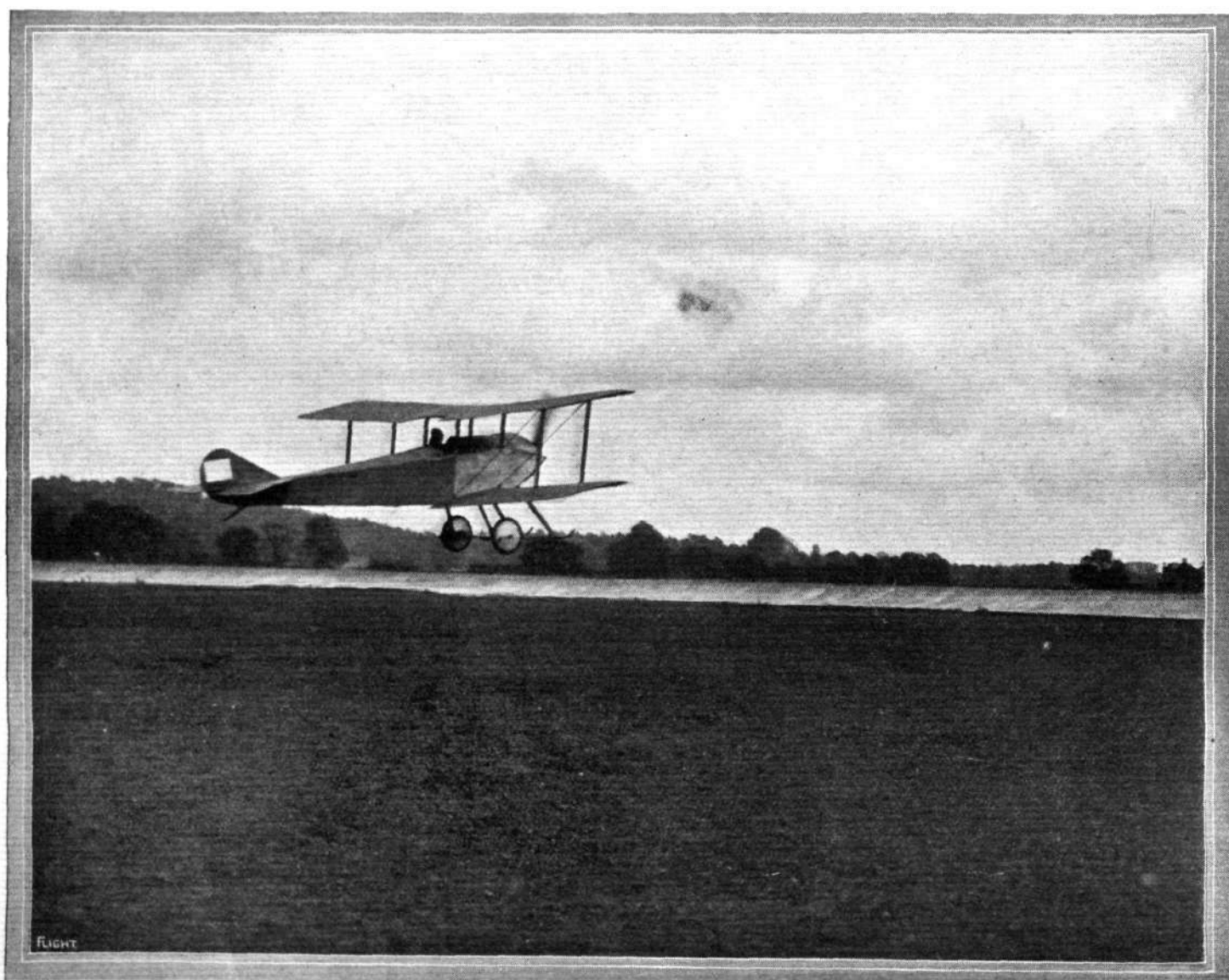
III.

Just an open desolate stretch of hill—
And the afterglow from the sinking sun.
Everything shadowy, quiet, and still
Save for one thing—nay, more than one.

Out over the hollows now green and dry
Soars a Thing that says in a whirring hum:
"Now are the days when Man can fly
After thousands of years. Now / am come!"

Out on the desolate side of a hill—
Ancient and ruined those circles of stone
Stand in the sunset—a temple still:
A link with the past and the priests of the Sun.

ANONYMOUS.



Mr. C. Howard Pixton on the Sopwith "tabloid" just getting off at Brooklands.

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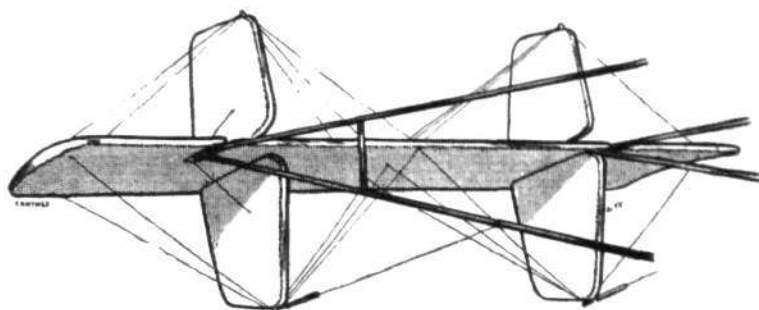
THE SANCHEZ-BESA BIPLANE.

THE subject of our scale drawings this week, the Sanchez-Besa biplane, which paid a brief visit to Hendon aerodrome during last week-end, is similar in its general arrangement to the machine exhibited at the last Paris Aero Show, when it was fully described in these columns. The chief alteration appears to be that this machine is fitted with an 80 h.p. Salmson engine, whereas the one at the Paris Show had a Renault engine. Also the tail planes have been slightly altered, so that now the rudders are mounted on and move with the elevator. The machine is built of steel almost throughout, and is mainly characteristic on account of its rather unusual type chassis, which consists of two stub axles universally pivoted to the rear end of the very long ash skid, and carrying two large diameter wheels which are sprung by means of rubber shock absorbers attached to telescopic tubes running from the outer end of the stub axle to the rear end of the lower *longerons* of the *nacelle*. The front end of the skid is supported on a structure of three steel tubes. Two smaller wheels mounted on a short tubular axle, prevent the machine from turning over on her nose on landing.

The *nacelle* is built up in the usual way, and provides accommodation for pilot and two passengers, the latter being seated side by side between the pilot's seat and the leading edge of the wings. A wind shield in the nose of the *nacelle* deflects the air above the heads of the

occupants. Behind the passengers' seat and inside the *nacelle* is mounted a large petrol tank, containing a supply sufficient for a flight of 4½ hours' duration.

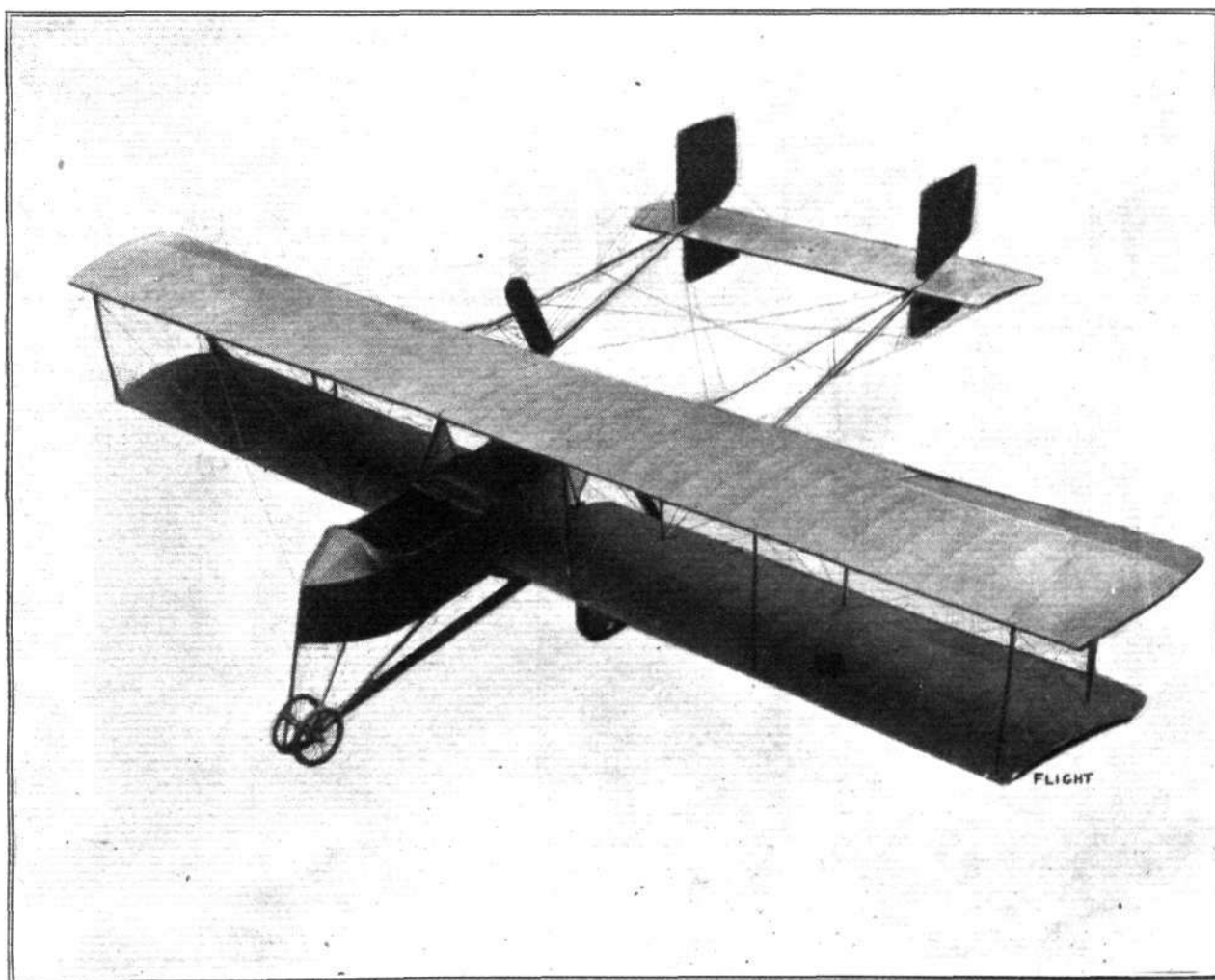
The engine, an 80 h.p. Salmson, is mounted between double bearings in the rear of the *nacelle*, and drives through a spur reduction gearing the large diameter pro-



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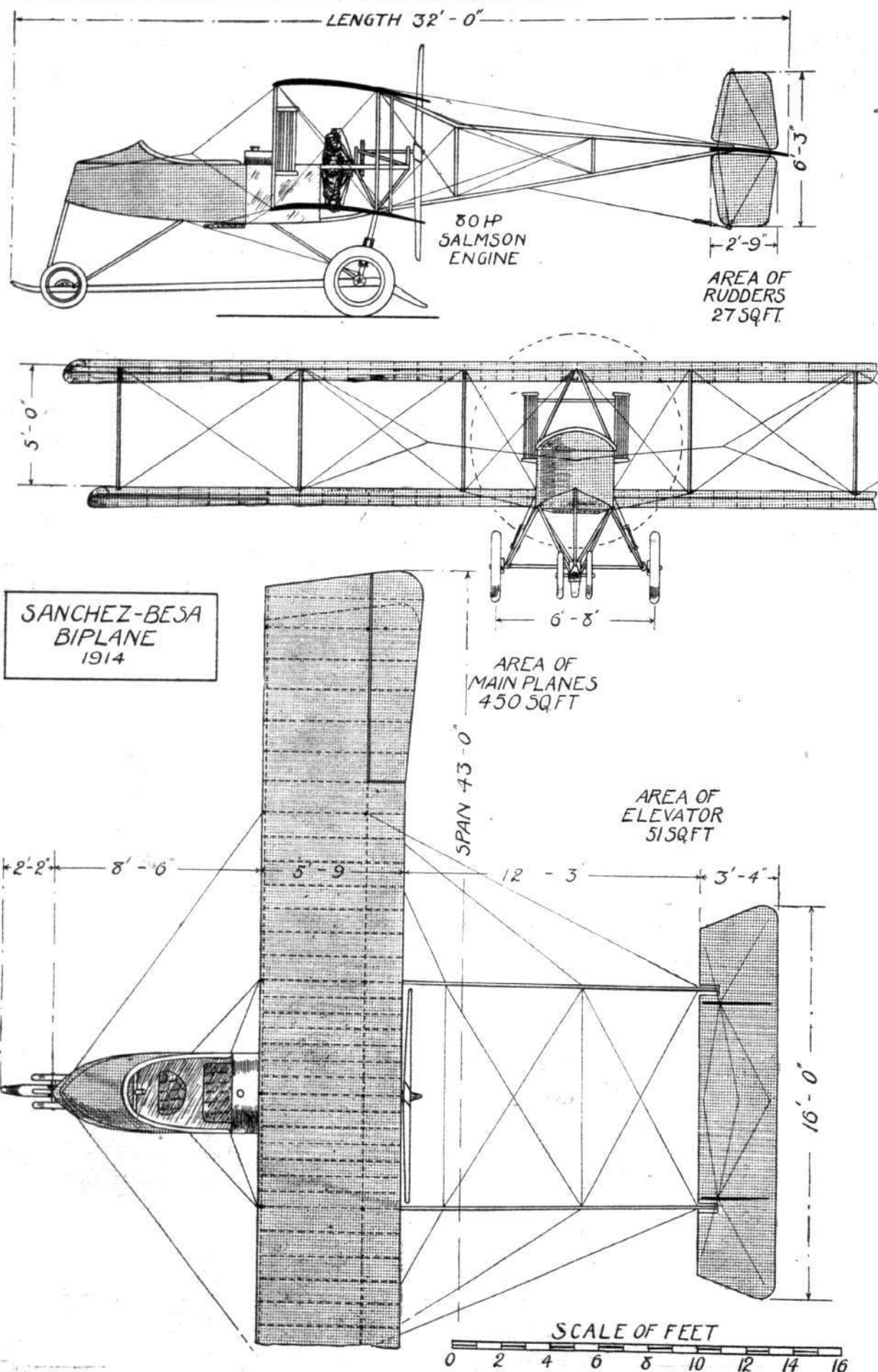
Tail planes of the Sanchez-Besa biplane.

peller which is situated behind the main planes. The propeller-shaft, which is mounted some seven or eight inches above the upper *longerons* of the *nacelle*, is supported on a structure of steel tubes, and has at its rear end a combined thrust and journal ball-bearing. The engine can be started from the passengers' seat by means



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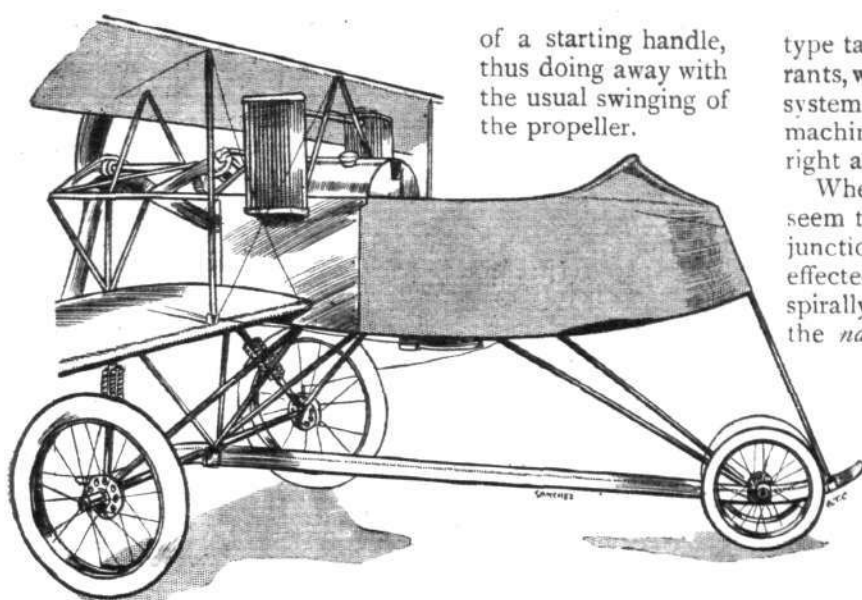
A view from above of the Sanchez-Besa biplane.



SANCHEZ-BESA
BIPLANE
1914

SANCHEZ-BESA BIPLANE.—Plan, side and front elevation to scale.

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Nacelle and chassis of Sanchez-Besa biplane.

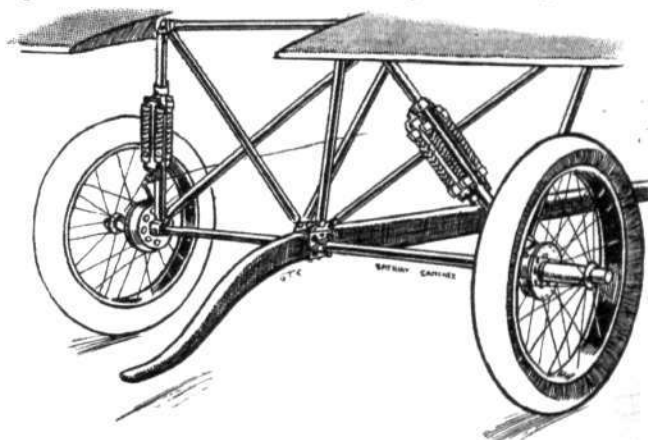
The main planes, which have a comparatively small gap in relation to the chord, are built up of wooden ribs over steel tube spars. Inter-connected *aileron*s are fitted to both upper and lower planes, and the chord of the *aileron*s is greater at the tip than at their inner ends in order to render them more efficient. The tail planes are carried on an outrigger formed by four steel tubes, and are unusual in that the two divided rudders are mounted on and move with the elevator, so that when the latter is moved up or down the rudders move backwards and forwards with it. This arrangement necessitates a rather unusual control gear, which consists of the usual central universally pivoted hand lever which operates the elevators through a series of quadrants underneath the *nacelle*. By means of these quadrants the movement of the elevator is geared up so that for a small movement of the hand lever the elevator is rotated through a comparatively large arc. The whole control gear seems unnecessarily complicated, and it is a question whether a different

of a starting handle, thus doing away with the usual swinging of the propeller.

type tail, which would do away with the use of the quadrants, would not be an improvement. However, the present system appears to work quite satisfactorily, and the machine certainly answers the controls very well, doing right angle turns in apparently less than her own length.

When doing a turn with the rudders only these do not seem to be any too large, but by using the *aileron*s in conjunction with the rudders exceedingly sharp turns can be effected. The machine appears to be perfectly stable spirally, in spite of the comparatively large side area of the *nacelle* in front of the centre of gravity, and last Sunday, at Hendon, the pilot—Delaporte—flew the machine in a high wind with both hands off the controls.

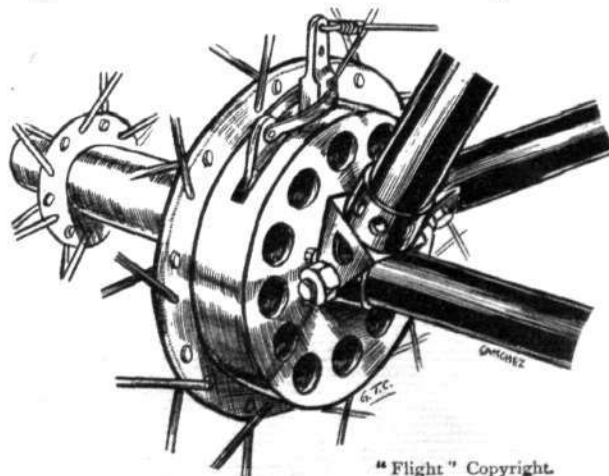
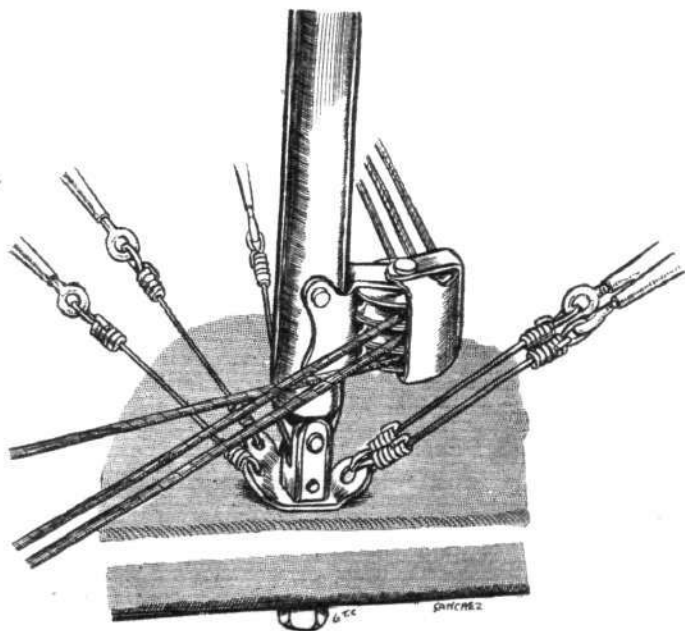
A refinement worth noticing in the machine, and one illustrated by the accompanying sketches, are the wheel brakes fitted on the rear wheels. By means of these brakes, which are operated from the pilot's seat, the machine can be held back by the pilot whilst running the engine all out, so that it is possible, by the aid of these brakes, and the starting handle behind the passengers' seat, to start the machine without any outside assistance whatever, a feature which should prove useful for cross-country work where, after having made a forced landing *en route*, experienced assistants are not always available, and where



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Rear portion of the Sanchez-Besa chassis.

the help of inexperienced, though willing, assistants may easily cause considerable damage to the machine. Another advantage of the wheel brakes is that on making a landing



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Left: Inter-plane strut attachment and control-cable pulleys on Sanchez-Besa biplane. On the right: Detail sketch of wheel brake.

in confined areas the machine can be stopped after a very short run along the ground; in fact, it appears to be possible to bring it to a standstill after a run of about twice its own length.

The weight of the machine empty is 1,750 lbs., her

✱ ✱ ✱ ✱

THE FATAL ACCIDENT TO MARTY.

IN connection with the accident which resulted in the death of Philippe Marty on Sunday week, an inquest was held at Hendon on the 29th ult.

John Stanton Chapman stated that Marty had given an exhibition of trick flying, and just before the accident he had been making some small circles with the engine off. The machine was about 100 ft. from the ground when the engine was shut off, and the machine fell head first to the ground.

Harold G. Carpenter also gave similar evidence.

Louis Noel said he tried Marty's machine earlier in the afternoon and found it all right. After the accident he examined it and ascertained that the controls were in order.

Richard T. Gates, general manager of the Grahame-White Aviation Co., said that in his last flight Marty flew several times round the course, and while doing so switched his engine on and off. That was done in order to reduce the speed of the machine—to try to fly at a slow speed. Marty was descending when he began a spiral. He did not do many circles, but those he did were very small and were not banked. Apparently Marty's intention was to go round and round and land, and when he was 40 ft. or 50 ft. from the ground the machine was perfectly straight. It seemed to bank a little, then stay motionless, then tip on its nose and dive to the ground. Witness thought that was brought about by the fact that Marty lost his speed, consequently bringing the machine round at a slow turn. If he had had another 250 ft. to drop he would probably have been able to operate his elevator successfully. Mr. Gates said he had no doubt that Marty was endeavouring to straighten the machine out as it came down, but it

maximum speed is 65 m.p.h., and the minimum flying speed about 35 m.p.h.

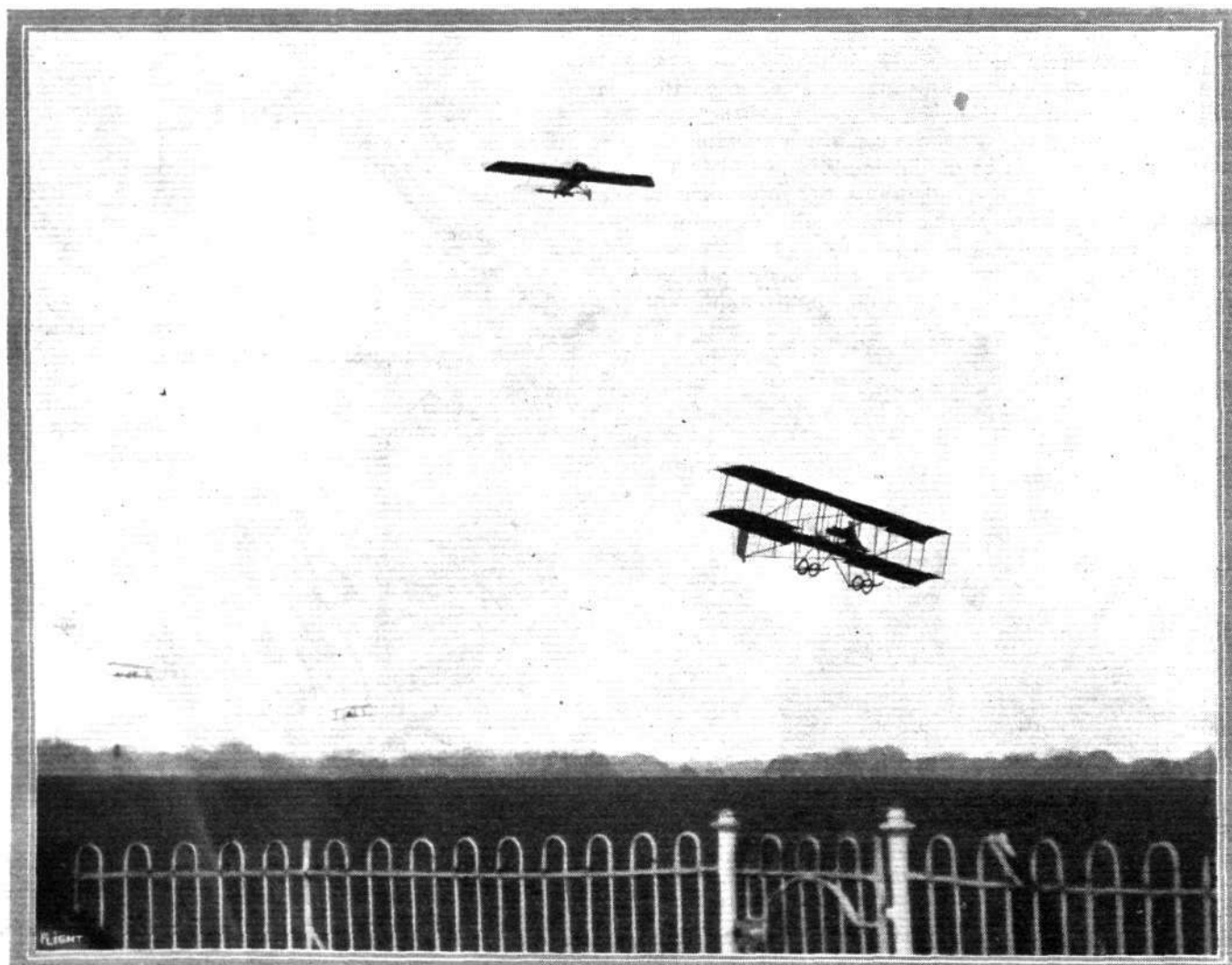
The machine described above has already gone back to France, but we understand that a similar machine, fitted with a 130 h.p. engine, will be coming over here shortly.

had not sufficient velocity to enable the elevators to act efficiently. The machine was passing too slowly through the air for the elevators to act efficiently and control the machine. Marty was an experienced aviator, and had a wonderful record for one so young. Possibly the accident was due to the fact that Marty left his motor switched off too long.

Mr. Grahame-White said that he did not see the accident, but from inquiries he had made he formed the opinion that Marty got into a steep spiral with his engine switched off, and there was a possibility that he switched on again and his motor would not go. Such a thing did happen sometimes. Failing that it might have been an error of judgment. Aviators, however skilled, did make such errors sometimes. Mr. Grahame-White said that he had just given permission to Marty to go to France for a week, and there was no necessity for him to have gone up again that evening.

The jury returned a verdict of "accidental death."

The remains of Philippe Marty were taken to France for interment on Thursday evening, and the coffin was borne to the funeral compartment in the boat express at Charing Cross by a party of men, under Superintendent Muller, from the 56th division of the St. John Ambulance Association. In the procession which followed were M. Maurice Marty (brother), Mr. H. E. Perrin (secretary, Royal Aero Club), Mr. Richard T. Gates (General Manager of the London Aerodrome), Mr. B. Isaac (secretary), Messrs. Louis Noel, W. Birchenough, Beatty, Howarth, Baumann, Carr, and Strange, with about a score of mechanics also from the aerodrome. Among the many floral tributes was one in the form of a monoplane "From Hendon Aviation Pupils and the Staff of the Aerodrome."



A MEMORY.—The late Mr. Philippe Marty flying in a race at Hendon.

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The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

JACQUES SCHNEIDER INTERNATIONAL MARITIME RACE.

Luncheon to Mr. T. O. M. Sopwith and Mr. Howard Pixton.

To celebrate the British victory at Monaco on April 20th, 1914, the Royal Aero Club will entertain Mr. T. O. M. Sopwith and Mr. Howard Pixton to luncheon at the Royal Automobile Club, Pall Mall, S.W. (by kind permission) on Tuesday, May 12th, 1914, at 1.15 p.m.

The Marquess of Tullibardine, M.V.O., D.S.O., M.P., the Chairman of the Club, will preside.

In order to facilitate the arrangements, Members are requested to notify the Secretary as early as possible, if it is their intention to be present.

Tickets, inclusive of wines, 10s. 6d. each.

Members are notified that on this occasion they may be accompanied by one guest only.

HAROLD E. PERRIN, Secretary.

Royal Aero Club,
166, Piccadilly, W.

LONDON AERODROME, HENDON.

The Directors of the Grahame-White Aviation Company, Limited, have kindly granted free admission to the London Aerodrome, Hendon, for the remainder of the year 1914, to all Members of the Royal Aero Club on presentation of their Club Membership Card (motor cars must be paid for).

Death of His Grace the Duke of Argyll.

The sad news of the death of the Duke of Argyll on Saturday, the 2nd inst., was received at the Club with great regret. His Grace had been Honorary President since 1908, and on many occasions assisted at the Club's functions. A message of sympathy was immediately sent to H.R.H. Princess Louise by Lord Tullibardine, the Chairman of the Club.

At the Memorial Service held at Westminster Abbey yesterday, the Royal Aero Club was represented by the Marquess of Tullibardine, M.V.O., D.S.O., M.P.

Third Aerial Derby, Saturday, May 23rd, 1914.

The Third Aerial Derby, being a 95-mile circuit of London, will take place on Saturday, May 23rd, 1914, at 4.15 p.m. The start and finish will be at the London Aerodrome, Hendon, and the following turning points have been fixed:—Kempton Park, Epsom Race Course, West Thurrock, Epping, Hertford.

Prizes.

Fastest Time	Daily Mail Gold Cup and £200.
Sealed Handicap { 1st Prize...	...	"Shell" Trophy and £100.
2nd "	...	£75.
3rd "	...	£25.

Daily Mail £5,000 Prize, 1914. Circuit of Great Britain.

(Under the Competition Rules of the Royal Aero Club.)

PRELIMINARY ANNOUNCEMENT.

The proprietors of the *Daily Mail* have offered the sum of £5,000 to be awarded to the entrant of the aeroplane which shall first have completed a prescribed circuit round Great Britain in flight within a period not exceeding 72 hours, under the following regulations:—

Regulations.

Date of Contest.—It is proposed that the race shall take place during the first fortnight in August.

Sunday Flying Prohibited.—There shall be no flying in the Competition between midnight on Saturday and midnight on Sunday, and the period shall not count in the 72 hours.

Qualification of Competitors.—Both the entrant and pilot or pilots must be British subjects and duly entered on the Competitors' Register of the Royal Aero Club. Pilots must hold an aviator's certificate issued by the Royal Aero Club or other club affiliated to the International Aeronautical Federation.

A passenger must be carried throughout the flights, and the combined weight of the pilot and passenger must be not less than 264 lbs., any deficiency in weight being made up by means of ballast. Pilots and/or passengers may be changed during the contest.

Qualification of Aircraft.—The complete aircraft and all its parts, including the motor, must have been entirely constructed within the confines of the British Empire, but this provision shall not be held to apply to raw material.

Entries.—The Entrance Fee is £100 per aircraft, and entries will be received up to 12 o'clock noon, May 30th, 1914. The Entrance Fee of £100 is payable either in one sum or as follows:—

£50 by noon on May 30th, 1914.

£50 by noon on June 20th, 1914.

Late entries will be received up to 12 noon, June 30th, 1914, in which case the Entry Fee will be £150.

The Entry Form, which must be accompanied by the Entrance Fee, must be sent in to the Secretary, Royal Aero Club, 166, Piccadilly, London, W.

No part of the Entrance Fee is to be received by the *Daily Mail*. All amounts received will be applied towards payment of the expenses of the Royal Aero Club in conducting the competition. Any balance not so expended will be refunded to the entrants.

Course.—The course will be a circuit of Great Britain, and the official starting-place and controls will be announced later. Competitors may make the circuit starting in either direction.

Controls.—The controls will be situated at or near each of the towns selected for the official controls, and competitors must alight at each of these controls for purposes of identification.

The aircraft must remain one hour in each control. During the first 30 minutes it must be entirely at the disposal of the officials for examination; the last 30 minutes may be utilised for replenishments and repairs. This period of one hour will not count in the 72 hours.

There is no restriction as to the number of starts made by a competitor, but in every case the start must be made from the official starting place.

Stoppages.—Stoppages between the controls are not prohibited, but all alightings must be effected on the sea, an inlet of the sea, an estuary, or a harbour. An alighting on land or inland water will terminate the attempt. (For the purpose of this contest the Caledonian Canal will be considered as the sea.)

Towing.—Towing is not prohibited, but the finishing line must be crossed in flight.

Repairs.—Individual replacements and repairs to the aircraft and motor may be made *en route*, but neither may be changed as a whole. The aircraft may be taken ashore for such repairs and replacements. Any time thus spent on repairs will count in the 72 hours.

No repairs or replenishments may be effected during the 30 minutes' allowance for official inspection in controls.

Five parts of the aircraft and five parts of the motor will be stamped or otherwise marked, and at least two marked parts of each of these five must be in place on arrival at each control.

Safety Appliances.—Competitors and their passengers must be equipped with life-belts or other appliances for keeping themselves afloat.

Shed Accommodation.—Accommodation for the aircraft will be provided at or near the official starting place free to each competitor for one week prior to start of the competition till the closing date.

General.

1. A competitor, by entering, thereby agrees that he is bound by the regulations herein contained or to be hereafter issued in connection with this competition.

2. The interpretation of these regulations or of any to be hereafter issued shall rest entirely with the Royal Aero Club.

3. The competitor shall be solely responsible to the officials for the due observance of these regulations, and shall be the person with whom the officials will deal in respect thereof, or of any other question arising out of this competition.

4. A competitor, by entering, waives any right of action against the Royal Aero Club or the proprietors of the *Daily Mail* for any damages sustained by him in consequence of any act or omission on the part of the officials of the Royal Aero Club or the Proprietors of the *Daily Mail* or their representatives or servants or any fellow competitor.

5. The aircraft shall at all times be at the risk in all respects or the competitor, who shall be deemed by entry to agree to waive all claim for injury either to himself, or his passenger, or his aircraft, or his employees or workmen, and to assume all liability for damage to third parties or their property, and to indemnify the Royal Aero Club and the proprietors of the *Daily Mail* in respect thereof.

6. The Committee of the Royal Aero Club reserves to itself the right to add to, amend or omit any of these rules should it think fit.

166, Piccadilly, W.

HAROLD E. PERRIN, Secretary.

FROM THE BRITISH FLYING GROUNDS.

Royal Aero Club Eastchurch Flying Grounds.

MONDAY, last week, fine, rather windy. The following machines were up:—No. 34 Short, 2 Short, 104 Sopwith, 40 Caudron, 49 B.E.

Tuesday, fine, rather windy. No. 2 Short, 40 Caudron, 65 Short, 36 Deperdussin.

Wednesday, fine. The following officers were up scouting:—Com. Samson, 50 B.E.; Lieut. Davies, 66 Short gun machine; Lieut. Marix, 104 Sopwith; Lieut. Osmond, 49 B.E.; Capt. Courtney, R.M.L.I., 36 Deperdussin; Sub-Lieut. Pierce, 16 Avro; also No. 34 Short and 31 H. Farman.

For the first time in Sheppey looping the loop was performed, "causing great excitement amongst the natives," from the Eastchurch Aerodrome. The airman claiming the honour of this distinction was Mr. Goodden, the Hendon pilot. He performed the feat five times on a Caudron before handing the machine over to the Admiralty.

Thursday, fine. Quite a lot of scouting was done. The following taking part:—Com. Samson, 50 B.E.; Capt. Courtney, R.M.L.I., 36 Deperdussin; Lieut. Clark, 40 Caudron; Lieut. Finch-Noyes, 31 H. Farman; Lieut. Osmond, 49 B.E.; Lieut. Marix, 104 Sopwith; Sub-Lieut. Pierce, 16 Avro; P.O. Edmonde, R.M.L.I., 34 Short.

Friday very windy, no flying.

Saturday, windy. The following officers left for Brooklands. Com. Samson, 50 B.E.; Lieut. Briggs, 39 Blériot Le Rhone, Lieut. Marix, 104 Sopwith.

Civilian Flying.—Tuesday, the Hon. M. Egerton made a fine flight on his 50 h.p. Short.

Wednesday, Mr. Ogilvie was out on both his machines, 50 N.E.C. and 25 Wright.

Saturday, M. Doumerque and passenger left France for Hendon on Thursday morning on a Bathiat-Sanchez, crossing over *via*

made a couple of flights on the Vickers gun 'bus. Major Becke (with Lieut. Chinnery as a passenger) came in on B.E. 239 from Farnborough, afterwards returning there. Lieut. Collett was testing the climbing speed of the Albatros biplane. Lieut. Stoddart came over from Farnborough on M.F. 389, and circled round the aerodrome for half an hour. The Sopwith "scout" biplane was also being further tested.

Further good work was done Tuesday by the pupils at the Vickers and Bristol schools.

Mr. Merriam was first out Wednesday on a Bristol biplane. Capt. Picton Warlow (with Sergt. Wilkinson as passenger) came in from Farnborough on B.E. 234, afterwards returning there. Lieut. Lawrence (with Capt. Brownrigg as passenger) also came over from



Mr. G. Carruthers, who has just secured his *brevet* on a 35 h.p. Caudron at the W. H. Ewen School, Hendon.



A trio of pupils at the Vickers Flying School, Brooklands, who have obtained their *brevets* on the Vickers biplane on the 16th of last month. From left to right these pilots are Comte FitzJames, Mr. Mark Dawson and Mr. Victor Wilberforce.

Boulogne. On reaching Dover he had to descend where he stayed until Saturday afternoon then left. He arrived at Eastchurch safe and put up until Sunday morning.

Sunday, the French airman left about 9 a.m. for Hendon. Mr. Ogilvie was out during the morning on both his machines, 50 N.E.C. and 25 Wright, and evening on his 50 N.E.C. making some good flights. Prof. Huntington made one short flight on his 70 h.p. Huntington-Dunne biplane.

Brooklands Aerodrome.

ON Monday morning, last week, both Bristol and Vickers pupils were at work, and Mr. Barnwell with a passenger was testing the new 100 h.p. Vickers gun-carrying biplane. Lieut. Collett was also out on the Albatros biplane. In the afternoon, Mr. Barnwell

Farnborough on B.E. 239, and returned after a short stay. In the afternoon Lieut. Collett (with Mr. Dukinfield Jones as passenger) was flying on the D.F.W. biplane, and the Bristol and Vickers schools were also at work.

Thursday afternoon Mr. Barnwell was testing the new 100 h.p. Vickers gun-carrying biplane.

Mr. Merriam made a solo flight on Friday on the Bristol biplane. In the afternoon, Lieut. Collett was out on the D.F.W. Mr. Hunt was doing straights on his Blériot monoplane; and the Blériot mechanics were putting a new 80 h.p. through its engine tests.

On Saturday the Vickers and Bristol Schools were at work. The Blériot mechanics were testing the engine of another new 80 h.p. Lieut. Briggs and Commander Samson arrived from Eastchurch on Blériot 39 and B.E. 50 respectively. Lieut. Collett was out on the D.F.W.

There was some fine exhibition flying on Sunday in a brisk wind by Mr. Pixton (before a French Commission) on the Sopwith "scout" biplane, and Mr. Barnwell on the new 100 h.p. Vickers gun-carrying machine, the latter taking up a number of passengers for cross-country trips, including the winner of the ballot for the free passenger flight, Mr. T. H. Condell, of Brunswick Lodge, Brunswick Hill, Reading. M. Marcel Desoutter flew to Hendon on a 50 h.p. Blériot. Mr. Hunt was out on his Blériot monoplane. Mr. Merriam was testing a new Bristol biplane.

The Bristol School have now shifted their pilots, pupils, and machines to Brooklands from Salisbury.

Bristol School.—On Sunday afternoon, last week, Merriam took the Brooklands passenger for a flight on the biplane and also another passenger, and then gave a trip to Lieut. Mills.

Monday, Merriam gave three tuition flights to Lieut. Mills, pupil having control. No other pupils turned up in the morning, and tuition was impossible in the evening owing to the strong wind.

After making several tests Tuesday, Merriam took Mr. Lucas for tuition and then sat behind Lieut. Mills on straights and circuits; he then took Mr. Lucas as passenger but the weather was too bad for further tuition. Merriam made a test later, taking Lieut. Mills, but the conditions were still unfavourable.

Merriam made a test flight Wednesday, and then took Mr. East-

wood twice, Lieut. Mills twice, Lieut. Smithies and Mr. Racine Jacques.

Thursday and Friday, impossible for tuition. Saturday, passenger tuition was given to Lieut. Smithies and Mr. Lagrange, but no further tuition was possible owing to the high wind.

Vickers School.—Instructors during past week Messrs. Barnwell, Knight, Elsdon, Webb. On Monday, Major Phillips, Lieut. Wood-Smith and Messrs. Liddell and Collins all with pilot. Lieut. Underhill and Mr. Liddell solos.

Tuesday, Major Phillips, Lieuts. Wood-Smith and Leighton with pilot. Mr. Murray and Mr. Steinbach (new pupil) with pilot. Lieut. Underhill and Mr. Liddell with pilot.

Wednesday, Lieuts. Wood-Smith and Underhill, and Messrs. Murray, Liddell and Collins with pilot. Lieuts. Leighton and Underhill and Mr. Liddell solos. Barnwell on gun-carrying biplane with passengers.

Thursday, Barnwell on gun-carrying biplane with two passengers.

London Aerodrome, Collindale Avenue, Hendon.

Grahame-White School.—Monday, last week, Messrs. Robinson, Peck, Cowley, Lowe straights with Instructors Lillywhite, Howarth and Strange. Mr. Wiles (new pupil) rolling with instructor, Mr. Moore solo straights. Mr. Parker and Mr. Smiles circuits, figures of eight, &c.

Tuesday, Messrs. Robinson, Peck, Cowley, Moore, Lowe, Boyesen, straights with Instructors Lillywhite, Howarth and Strange in passenger seat. Messrs. Parker, Smiles, and Major Piercy solo circuits, &c.

Wednesday, Mr. Parker circuits, figures of eight, &c., afterwards going in for and passing *brevet* tests. Mr. Smiles and Major Piercy solo circuits, &c. Messrs. Robinson, Boyesen, and Peck straights with Instructors Howarth and Strange in passenger seat.

Beatty School.—Monday last week Messrs. Bentley, 7 mins.; Ruffy, 7 mins.; Allen, 7 mins.; Banks-Price, 7 mins.; A. Cheung (new pupil), 5 mins.; Hodgson, 7 mins. Mr. W. Rowland Ding then took machine and passed for his pilot's certificate in good style, afterwards reaching an altitude of 1,150 ft. in his test flight, planing down from this height with his engine cut off.

Afternoon school: Watts, 12 mins.; Ruffy, 10 mins.

Tuesday, Watts, 8 mins. and 7 mins. alone; Stewart, 7 mins. and 6 mins. alone; Garvin, 8 mins. and 5 mins.; Major Piercy, 3 mins.; Edridge-Green, 10 mins.; Allen, 15 mins.

Wednesday, Edridge-Green, 15 mins.; Ruffy, 10 mins.; Garvin, 10 mins.; Cheung, 5 mins. Then Mr. Baumann took Mrs. Allen up for a joy ride.

W. H. Ewen School.—The weather last week was too windy for school work, and the only day pupils were able to go out was Saturday, when they started at 5 a.m. After a test flight by Mr. W. T. Warren, Mr. Curtis did figures of eight and circuits in a ten-mile wind, and Mr. Garvin circuits.

Hall School.—At 5.30 a.m. Monday last week, A. F. Arcier four half circuits at 40 ft. L. Edgcombe Palmer three circuits at 100 ft., followed by three good figure eights at 200 ft. Miss d'Elsa later on in day did several good straights on "Penguin," 25 h.p. Anzani.

Too windy for pupils alone, Tuesday. L. Palmer had a lengthy passenger ride on Avro with J. L. Hall. In afternoon J. L. Hall took up several lady passengers, including a Miss Hutton.

Thick mist Wednesday morning prevented practice, but in evening the wind dropped and machines were brought out. A. F. Arcier, who is showing good progress, made several good half circuits at 35 ft. Then L. Edgcombe Palmer, mounting No. 1 Caudron, made six figure eights at varying altitudes, but seemed to have trouble in landing on the mark. Gearing did two straight flights at 10 ft., flying steadily. Messrs. J. Rose and A. F. Arcier had flights with J. L. Hall on Avro. Toward dusk J. L. Hall, accompanied by Dennis Ware, of the R.F.C., made a wide detour of surrounding country, ultimately reaching 2,600 ft., afterwards descending in long spiral *vol plané*, lasting several minutes.

No practice Thursday owing to the high wind, and Friday, Saturday and Sunday a gale blowing.

Shoreham Aerodrome.

Pashley School.—Very little work was done last week owing to the strong winds. Straights, alone, Messrs. Wey, Nichole. Circuits and eights, Mortimer and Hale.

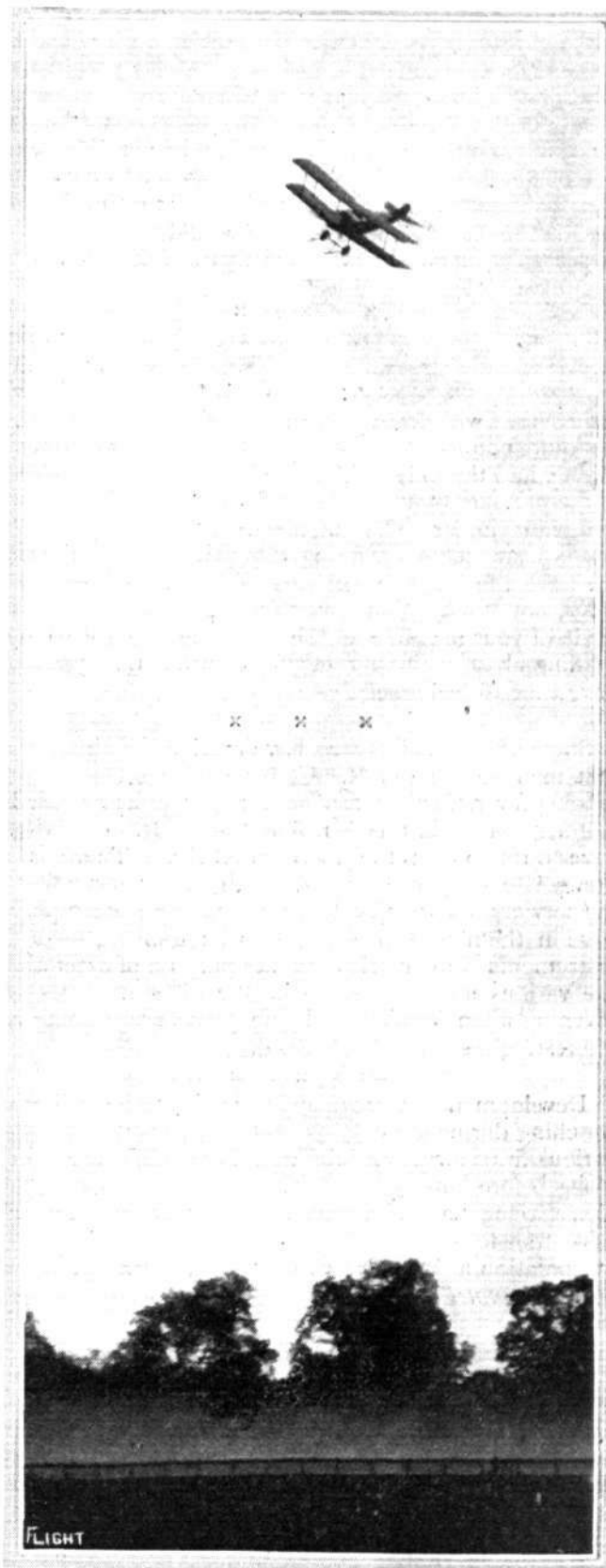


Wilbur Wright Memorial Lecture.

THE second Wilbur Wright Memorial Lecture before the Aeronautical Society will be delivered at the Royal United Service Institution, Whitehall, S.W., on Wednesday, the 20th inst., at 8.30 p.m. Dr. R. T. Glazebrook, C.B., F.R.S., will be the lecturer this year, and is taking as his subject "The Development of the Aeroplane." The Right Hon. Lord Sydenham, G.C.M.G., F.R.S., will preside.

The Daily Mail Round Britain Flight.

THOSE who contemplate taking part in the Circuit of Britain competition next August for the *Daily Mail* £5,000 are reminded that the entries close on the 30th at the ordinary fee of £100, but late entries at the fee of £150 will be accepted by the Royal Aero Club up to June 30th. The entry fee may be paid at once or in two instalments. The rules and conditions of the event will be found in full under the Royal Aero Club Official notices on page 491.



"Flight" Copyright.

THE SOPWITH "TABLOID" AT BROOKLANDS.—
Mr. Howard Pixton banking for a turn.

EDDIES.

It is not the privilege of every pilot to get a view like that enjoyed by Norman Spratt some time ago, when he took the 120 h.p. Austro-Daimler engined R.E. 5 biplane up to a height of 18,900 ft. as recorded by his barograph. From this height the view obtained was simply magnificent, for the day was one of those exceptionally clear ones which occur so rarely in our climate, and the height was one not reached every day. In fact it must constitute a record for this country—subject to official notification. Mr. Spratt informs me that to the east he could see the estuary of the Thames, whilst to the south could be seen the whole south coast, including the Isle of Wight, the hills of which were plainly visible. The mist which hung over the mouth of the Severn prevented him from seeing the Bristol Channel, otherwise he would have been able to see right across the southern part of England, from sea to sea.

x x x

The atmosphere at this height must have been pretty chilly, for Mr. Spratt stuck his gauntlet outside the fuselage for a few seconds, and when he drew it back it was covered with frost. Inside the fuselage, however, it was quite comfortable, owing to the warm air from the engine, and the only discomfort he experienced was due to the pressure of air inside his knee joints, which caused him pains similar to rheumatism. At no time did the rarefied air make breathing difficult. Asked if he did not have a feeling of loneliness, his emphatic reply was: "No, not at all. You have to be watching the climbing angle of your machine all the time, and you are so busy fiddling about with your engine controls that you don't have time to feel lonely."

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Some of our readers may have received the impression that members of the R.F.C. have been smitten by the looping fever, since it has been reported, as recorded in FLIGHT last week, that Mr. Spratt and Mr. de Havilland have both looped the loop on B.E.'s. There is no immediate danger, however, of the fever spreading to the services, for the few loops which were accomplished were in the nature of a scientific experiment, recording instruments being carried for the purpose of ascertaining the various stresses set up in the different parts of a machine when looping, and one gathers that some very interesting results were obtained.

x x x

Developments at Brooklands promise to be well worth watching during the coming season, as, in addition to the various firms already established there, others are coming along before long. The British and Colonial Aeroplane Co., having had to vacate their hangars at Lark Hill, have transferred their Lark Hill School to the one now in operation at Brooklands, which will, of course, increase both *personnel* and *matériel* at the latter school considerably.

x x x

The new Blériot works at "the bowl" are now practically finished and several machines are nearly completed, in fact three tandem two-seaters ordered by the Government will in all probability be delivered during the latter part of this week. All three of these machines are of the new type, having the seats placed close together in order to allow of flying them with or without a passenger. If desired a large petrol tank can be fitted in place of the passenger's seat so as to increase the radius of action of the machine. The operation of substituting the tank for the seat, or *vice versa*, can be

carried out in the short space of 15 minutes. Several school machines are to be put in hand shortly, including two or three with 50 Gnoms, one with a 45 Anzani, as well as several of the usual 35 "Y" type Anzani. And last, but not least, there are the *pingouins*.

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With such a variety of machines at the disposal of the pupils, and with its facilities for repairs in case of smashes, the Blériot school should soon become very popular. One of the hangars is being rebuilt, and will when finished, form a spacious lounge, where pupils can have a smoke while discussing events of the day, whilst at the back of this lounge will be some ten or twelve small cabins for the use of pupils who wish to have their own room in which to change, &c. Pupils who are anxious to take advantage of the morning calms will thus be able to sleep in their room over night, so as to be on hand in the morning without wasting time in getting down to the aerodrome.

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Mr. Barnwell has been carrying out alterations to the Vickers gun-carrying 'bus which has now had the side area of the nacelle considerably reduced, and a larger tail fin has been fitted. It was found that, as the propeller revolved anti-clockwise as seen from the rear, the air thrown back by the upper blade struck the right-hand side of the tail fin whilst that deflected by the lower blade did not strike any vertical surface, and the result was that the machine had a tendency to turn to the right. Mr. Barnwell hopes that by reducing the side area of the nacelle and bringing the tail plane more in line with the propeller this difficulty will be overcome.

x x x

A new and very interesting biplane of the pusher type is nearing completion at the Brooklands works of Messrs. Martin and Handasyde. This machine is built almost entirely of steel and is expected to be very fast. She will be fitted with an Antoinette engine of 65 h.p. It must not be concluded from the fact that they are building a biplane that the Martinsyde firm have forsaken their old love, the monoplane, for a new and much larger monoplane is due to leave the stocks within the next two months. The wing bracing of this machine will be on rather novel lines in order to provide the necessary strength for a machine of so large a size as this one will be. It is probable that a Sunbeam engine will be fitted. I learn from Mr. Martin that there is a possibility of a Martinsyde mono. being entered for the Circuit of Britain Waterplane race. We shall look forward to seeing the Martinsyde firm on the list of entrants, for besides wishing them big success, the more machines competing the keener will naturally be the interest taken in the race by the public.

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It appears that M. Louis Breguet is at last discarding the old system of wing construction, to which he has adhered so consistently since the days of his first successful machine, for the machine flown by Moineau at Monaco recently was fitted with a double row of struts instead of the single row of struts in previous machines. I cannot help thinking that if M. Breguet could have been induced to effect this alteration a little sooner the English Breguet firm would possibly still have been a going concern, for the Breguet machines certainly have a lot of good points in their favour, and this latest alteration should go a long way towards regaining their popularity.

That the aeroplane should figure very largely on the films is but what might be expected owing to the interest taken by the public in flying, and it is more exciting to watch a man drop from an aeroplane on to a moving train than to see him change from one motor to another at full speed. It is, of course, impossible that some of the scenes demanded by an excitement-loving public, could really take place without grave danger of injury to the actors, and so they have to be "pretended" to a great extent. I suppose an aeroplane is somewhat of a difficult beast for the manager of a cine firm to handle and he is liable to overlook small matters of detail which will catch the critical eye and label it as a fake. But surely someone at the "aerodrome" studio might just look to things technical a little. I saw a picture in one of the papers the other day which showed a man dropping from the bottom wing of a biplane on to a moving train, and the *aileron* was hanging straight down, with the control wire quite slack. Even in "Through the Clouds," good as it was, there were one or two little things that did not seem to "work." I know it is very difficult but some of the things overlooked are quite bad.

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Evidently the 200 h.p. Salmson engined Wight seaplane, designed by Mr. Howard Wright, which was shown at the last Olympia Aero Show, has proved even more successful than were its predecessors. Mr. Gordon England tells me that the machine behaves splendidly both in the air and on the sea. With a useful load of 950 lbs., including a wireless set, she climbed to a height of 3,000 ft. in 8½ minutes, in spite of the fact that for the first thousand feet or so considerable difficulty was experienced in getting her to climb owing to the peculiar state of the air. According to Mr. England, this machine is as nearly fool-proof as one can reasonably expect a machine to be. In fact, I understand that directions for handling her are mounted on the dash in front of the pilot, and that if he follows

these directions he cannot possibly go wrong. The longitudinal stability of the machine is particularly good, and she flies absolutely on the throttle, so that from the last twenty or thirty feet all that is necessary is to throttle down and the machine will come down gently on an even keel without any bumping whatever.

x x x

Quite recently cinematograph pictures were taken from the machine, particularly of the effect on the floats when alighting, the operator sitting on the nose of one of the floats. In spite of the weight of the operator and photographic apparatus being placed so far out in front and on one side, the machine flew beautifully. Mr. England tells me that the machine gets off the water in seven seconds, and that she has, for a seaplane, the very good speed range of 78-40 miles per hour. I understand that the Navy is particularly well pleased with the machine, and that sufficient orders have been received by Messrs. J. Samuel White and Co. to keep them very busy for a long time to come, whilst it looks as if Foreign Governments will have to bid against each other for first deliveries.

x x x

It appears that the new Howard Wright double-cambered propeller is very efficient, for it has been found by experiments that for a certain power the diameter of this propeller can be kept much smaller than that of the ordinary type of propeller.

x x x

Marcel Desoutter, the young pilot who, it will be remembered, had his leg injured in a smash on his monoplane last year, made a cross-country flight from Brooklands to Hendon on Sunday last. Starting from Brooklands at 6.10 p.m., on Lord Edward Grosvenor's Blériot monoplane, he set his course for Hendon, after first having made one or two preliminary flights round the Brooklands aerodrome. Owing to a slight ground mist he lost his way, however, and came down in a field



"Flight" Copyright.

Marcel Desoutter, who is now flying again, about to leave Brooklands on Sunday last for Hendon on Lord Edward Grosvenor's Blériot.

to ascertain his whereabouts. As he was afraid to stop his engine he kept switching on and off whilst shouting to some people who had rapidly gathered in the field when they saw him come down, to tell him in which direction lay Hendon. It was very amusing, Desoutter tells me, to see the nervousness of the people. Whenever he switched off his engine the people drew a little closer, but every time he switched on again they scattered like a flock of chickens, and he had the greatest difficulty in getting one of the men to come close enough to hear what Desoutter wanted. He was then told to follow the railway line, which would take him right past the Hendon aerodrome, where he did not arrive until 7.30, owing to the delay caused by having to come down and enquire his way.

BRITISH NOTES

ROYAL FLYING CORPS.

THE following appointment was announced by the Admiralty on the 4th inst. :—

Sub-Lieut. R. Wright, R.N.R., to the "President," additional, for course of instruction at the Central Flying School, to date May 12th.

ROYAL FLYING CORPS (MILITARY WING).

WAR OFFICE summary of work for week ending May 1st, 1914 :—

No. 2 Squadron. Montrose.—All three "flights" were out most days during the week engaged in reconnaissance training. Two machines were flown from Farnborough to Montrose. The Squadron is busy preparing for the move southwards to the Concentration Camp at Netheravon.

No. 3 Squadron. Netheravon.—Numerous cross-country reconnaissance flights were made by the pilots of this Squadron and observation of artillery fire was carried out on April 28th and 29th.

No. 4 Squadron. Netheravon.—The pilots of each "flight" were out daily, the work consisting chiefly of cross-country reconnaissance and observation of artillery fire. Some night flying was also carried out.

No. 5 Squadron. S. Farnborough.—The pilots of this Squadron were out daily and numerous cross-country reconnaissance flights were made.

No. 6 Squadron. S. Farnborough.—Flying took place daily over the country round Aldershot.

Aircraft Park.—Repair work on aircraft and M.T. and technical instruction of recruits were continued.

Headquarter Flight.—Experimental work on various lines was carried out. Several kite ascents and free balloon runs were also made.

General News.—Two more aeroplane squadrons commenced forming at Farnborough on May 1st. The Squadrons will be commanded by Capt. Longcroft and Capt. J. Salmond, who are being transferred from No. 2 Squadron and the Central Flying School.

R.F.C. Developments.

IT will be seen from the weekly summary of the official doings of the Military Wing of the Royal Flying Corps that two new squadrons are now in process of formation. One will be under the command of Capt. Longcroft, who is being transferred from No. 2 Squadron, while Capt. Salmond, from the Central Flying School, will command the other.

In the Army Orders for May, it is notified that in future the "Flying Depot, Lines of Communication," will be designated the "Aircraft Park."

Mr. B. C. Hucks at Chesterfield.

AS the chief attraction in connection with the Chesterfield Shopping Festival, Mr. Hucks demonstrated there on Wednesday, Thursday, Friday and Saturday of last week. On the first day Mr. Hucks commenced by manœuvring his "80" Blériot in strange and wonderful ways. On the looper, Mr. Hucks started with a triple, and completed 7 loops in the flight. Afterwards on the 80 he flew to Brimington in response to the special request of an invalid gentleman who had never seen an aeroplane. On Thursday, 6 loops were made, in addition to stunts on the two-seater, but the wind was too tricky for passengers. On Friday, Mr. Hucks circled Brimington Church spire, and looped 9 loops. An immense "gate" turned up on Saturday. The thrill of the afternoon was an upside-down flight, during which Mr. Hucks took one hand off his controls

It appears that Desoutter is going to profit in a somewhat unexpected way by his mishap last year, in which he lost one of his legs. When he got well he had a wooden leg made, but finding this a bit too heavy for his liking, and being of an ingenious turn of mind, he set to work to make one himself, and a very good job he has made of it. The leg is made of a framework of a special aluminium alloy covered with leather, and he has succeeded in getting down the weight as low as 2 lbs. Since it became known how successful Desoutter has been in making this leg, he has had a great number of letters from people who have lost one of their legs asking him to furnish them with legs of a similar construction to that which he has made for himself, and he has now patented the process of making artificial legs. "ÆOLUS."

OF THE WEEK.

and waved it in the air. In all 9 loops were made, and Mr. Hucks also gave a splendid exhibition on the 80.

This week Mr. Hucks is at Leicester. Norwich will be visited on May 14th, 15th and 16th. Mr. Hucks' new 50 h.p. looper arrived at Hendon last Thursday, and will have been used for the first time at Leicester on Wednesday of this week.

The Schneider Cup Competition.

IN our account of the flying for the Jacques Schneider Cup at Monaco, it was stated that Lord Carbery retired as he was not used to a Deperdussin. It will be remembered that owing to a mishap to his own Morane-Saulnier, Lord Carbery arranged to use Janoir's Deperdussin. Writing to us on the matter, however, Lord Carbery states that the real reason why he abandoned the race was that the sparking plug wires got crossed, as happens sometimes with a two-group motor. This resulted in back-fires at intervals, and although the trouble was attended to by the mechanics, it recurred after another round. Lord Carbery adds that although he had not flown either a Deperdussin or a machine of 160 h.p. before, let alone in a 30-mile wind, he never was more at home.

Models at Burton Water Carnival.

A MODEL waterplane competition is to be a feature of the Water Carnival which is to be held on the River Trent at Burton, on Saturday, August 20th. The competition will be open to model makers in the Midlands, and among the prizes will be a valuable challenge vase offered by Lord Anglesey.

Approaches to Shoreham.

IN commenting upon the flying at Shoreham at Easter time our correspondent referred to the inaccessibility of the aerodrome. This was not meant to imply that there was not a sufficient number of approaches, but rather that after the continuous rains the approaches were in such a muddy condition that it was not too pleasant for cars and motor cycles to reach the flying ground. However, since then this matter has been attended to, and we learn that all the aerodrome roads are now in real good order.

Volk's Seaplane Hangar at Brighton.

AVIATORS who are thinking of paying a flying visit to Brighton should note that Volk's Seaplane Hangar has been re-erected on the front and is now ready to accommodate any machine at short notice.

Simplicity and Success in Photography.

THE merits of the "Tabloid" system of photography are too well known to need any lengthy reference to them here, but, in view of the fact that the ranks of amateur photographers are continually being added to, attention may be drawn to a little brochure entitled "Simplicity and Success in Photography" which has just been issued by Messrs. Burroughs Wellcome and Co. Among the many useful hints which it contains, not the least interesting are those dealing with up-to-date colour toning methods. The booklet, which will be sent to any amateur applying to Messrs. Burroughs Wellcome at Snow Hill, London, E.C., is illustrated by several reproductions of toned prints, including one secured by Mr. H. G. Ponting of Capt. Scott's expedition.

The Fabbri Photographic Apparatus.

WE are informed that the Integral Propeller Co., Ltd., have been appointed sole agents for Great Britain and the Colonies for the Fabbri Photographic Apparatus, which, it may be recalled, was exhibited at the last Olympia Show on the Bristol Stand. All enquiries regarding the apparatus should be addressed in future to the Integral Propeller Co., 1B, Elthorne Road, Upper Holloway, N.

NAVAL AND MILITARY ENGINE COMPETITION, 1914.

ON the occasion of our visit to the Royal Aircraft Factory at Farnborough on Saturday last, six engines, all of which are water-cooled, were to be seen erected upon the fixed test beds—the 130 h.p. Argyll, a 100 h.p. E.N.V., a 95 h.p. Dudbridge Ironworks Salmson, the 135 h.p. Sunbeam, the 130 h.p. Wolseley and a 130 h.p. White and Poppe engine—but none had actually commenced their official trials, although several had been run for short periods by the makers. It was anticipated, however, that several would be ready for the six hours' trial by Monday last. This trial may be regarded, in some measure, as an elimination test; but as so many of the entrants have had extensive experience in this class of work and several engines have already undergone much more prolonged tests, it would appear to be possible that many of these engines should, except for some bad stroke of fortune, experience little difficulty in coming through it successfully.

Although all test beds are exactly similar, and the rooms, excepting that at the extreme end, in which they are placed are of the same size, it was considered by the Judges' Committee that it would probably be more satisfactory to all concerned if the decision as to which bed any particular engine should be mounted upon for the tests were made by drawing lots; and a similar procedure has been adopted in determining the order in which the engines are to be tested. It is possible, however, that for greater convenience, such makers as have a number of engines entered for the competition, will be permitted, by arrangement, to complete the tests of all their engines on the fixed beds consecutively, as of necessity they will have all their tools, &c., in the compartment allotted to them.

Full particulars of the conditions governing the competition, which still stand, except for one modification, namely, that the magneto need not necessarily be of British manufacture, have already appeared in *FLIGHT*, but these have been amplified in a circular embodying instructions to competitors, and it is interesting to observe that all engines will be permitted to make two attempts to complete the six hours' continuous trial, but a further attempt may be allowed, under exceptional circumstances, where a satisfactory reason can be advanced by the entrant for according such permission. Should any competitor claim some special advantage for his engine that is not included in the official list of desirable attributes (see *FLIGHT* for June 14th, 1913), on the satisfactory conclusion of the six hours' preliminary trial he may request that such special qualities be tested, and the Judges' Committee will then decide as to whether, and in what manner, such special test is to be made. On the completion of the six hours' preliminary trial and the special test, if carried out, the judges are at liberty to subject the engine to any test that is calculated to show its usefulness for service in any type of aircraft. These will probably embrace tests on the tilting beds, and much more prolonged runs at full and/or reduced powers on the fixed beds; as although the normal hours of working are limited to from 8 a.m. to 6 p.m., these periods may be extended at the discretion of the judges; or, the test may be continued on the succeeding day or days without any adjustments being permitted—the latter procedure corresponding somewhat with the ordinary conditions existing in practice, and perhaps being rather more severe.

The parts of the engine which are liable to wear may be examined on the conclusion of the individual trials, the fuel, oil, &c., will be measured in the course of the tests (as described in *FLIGHT* for the 25th ult.), while such other observations will be made by the judges, or at their direction, as are considered necessary in order to determine to what extent the engine possesses the desirable attri-

butes previously referred to. It is worthy of notice, as indicating the degree of accuracy obtainable with the petrol flow-meter, that in the course of tests conducted on actual engines by the Inspection Department under the direction of Capt. R. K. Bagnall-Wild, the records obtained from the flow-meter differed by less than one per cent. from the actual fuel consumption figures determined by observing the amount of fuel consumed from the main petrol tank throughout the whole trials.

When the competitor has informed the secretary that his engine is ready for test, it is placed under the observation, during the working periods, of an engine-room artificer and a staff-sergeant (of whom six have been detailed for this purpose) from the Naval and Military Wings respectively of the Royal Flying Corps, and no work on the engine or even access to it is subsequently permitted except under the observation of an official appointed by the Judges' Committee. The measurements of weight, fuel, oil, water, temperatures, air speed, engine speed, brake load, &c., will be made under the direction of the Judges' Committee; but assistance in obtaining the correct results may be required from the maker of the engine under test. Every endeavour has been made to completely exclude all who are not directly concerned in the tests from the engine testing rooms—each of which is locked up when the firm's representatives are absent—as day and night watchmen have been appointed to keep off unauthorised persons, and although so closely adjacent, there is no communication between the building in which the engines are located and the Royal Aircraft Factory. At the end of the competition, however, the special enclosure surrounding the test house will once more be thrown into the Factory and the plant will be used for testing engines delivered by contractors and submitted to the authorities, under comparable conditions.

It is anticipated that the tests will last for a period of about three months, the reason for which will be readily understood when the number of engines submitted, and the extensive and prolonged character of the tests that will undoubtedly be required to differentiate between the various engines after the principal trials have been carried out.

No official information as to engine performance will be published in any way whatever until after the completion of the preliminary six hours' tests, but a statement of performance will be issued to each competitor at the end of the competition, and the firms concerned will be acquainted with the data relating to their own engines as the trials proceed. No marks will be published at any time, but certificates of performance may, at the discretion of the Judges' Committee, be given on the completion of the competition.

In their instructions to competitors, the Judges again emphasise that "no undertaking is made or implied that all or any particular number of engines will be ordered from the competitor whose engines give the best performance, or is awarded the £5,000 prize if for any reason the Judges should consider that ordering any other of the engines duly entered in the competition is of more value to the public service than the prize winner." The instructions also state that "before placing any orders for engines as the outcome of the competition, the Judges' Committee may make such investigation into the works' equipment, method of procuring supplies, financial standing, &c., of the producers of the engines, as they may think fit to ensure the completion, in the United Kingdom from British sources, in a reasonable time, of the engines proposed to be ordered."

Mishap to the "Adjudant Reau."

WHILE the envelope of the French military airship "Adjudant Reau" was being inflated at Verdun on the 2nd inst., the fastenings of the net which was holding it down gave way. The gas-bag then rose to the roof and was seriously torn by the girders of the roof of the hangar. Fortunately no one was hurt, but the damage done was considerable. It will be recalled that this airship holds the airship records for distance and duration, having travelled 1,000 kiloms. in 21 hrs. 23 mins.

Long Cruise by Italian Dirigible.

THE Italian military dirigible "P5" on Wednesday of last week covered a circuit from Verona to Udine, Venice, Campalto and back to Verona in eight hours, the distance covered being about 500 kiloms.

7½ Hours' Cruise by "Z7."

LEAVING Johannisthal at 12.8 a.m. on May 1st, the new German military dirigible "Z7" cruised to Posen, where it will be stationed for some time, arriving there at 7.30 a.m.

The Accident to the Schutte-Lanz,

AS recorded in our last issue, the new Schutte-Lanz airship "SL2" started from Mannheim on her official 20 hours' duration trial on Tuesday evening of last week, and after cruising over Cassel,

Bremen, Hamburg, Kiel, Berlin, Potsdam, Jena, and Merseberg, finally arrived on Wednesday evening at Leipzig. During the cruise there had been a heavy leakage of gas, and on arrival at Leipzig, although the full 20 hours had not elapsed, the pilot deemed it prudent to land. In response to a message dropped from the vessel about two hundred soldiers were hurriedly collected and the airship was slowly brought down, until within about 150 metres of the ground, when it dropped suddenly. Considerable damage was done to the cars, while the propellers were smashed and the wooden framework of the envelope broken in parts. Although the airship failed by about half an-hour to complete the 20 hours' trial, it is stated that she has been accepted by the German military authorities, and will be repaired as quickly as possible.

German Balloonists Sentenced in Russia.

AFTER being detained for nearly two months the three German balloonists, Berliner, Haase and Nikolai, who landed at Perm when attempting to beat the world's distance record, have been sentenced to six months' imprisonment or pay a fine of £210 each, for landing in Russia without permission. The charge of espionage was dismissed. The 58 days they have been detained is to be deducted from the term. Great indignation has been aroused in Germany by the severity of the sentence.

THE MEASUREMENT OF AIR SPEED.*

By A. P. THURSTON, D.Sc., F.R.Met.S., Associate Fellow Ae.S.

It is a matter of extreme importance to be able to measure accurately the speed of the air in any situation and under any condition, because all our knowledge of the dynamical properties of the air is dependent upon a correct measurement of its velocity, and because the safety of a pilot depends upon knowing accurately the speed at which he is flying. He is then able to guard himself against the risk of stalling his machine or of attaining too great a speed. An air speed indicator is really as indispensable to a pilot as a foot rule is to a carpenter, or a "hooter" to a motorist.

The velocity of the air may be determined by three main methods.

(1) In the first method the velocity is measured directly by the time taken by a particle, body or substance floating in or dragged along by the air to travel from one point to another. Under this category all rotating helical vane instruments are generally included. This may be called "the velocity method" or "*v* method," as the reading obtained is independent of the density of the air.

(2) In the second method the velocity is obtained by measuring the mass of air passing a certain point, as, for instance, by measuring its cooling or evaporative effect. This may be called "the density velocity method" or "the ρv method," since the mass of air passing in a given time is proportional to the product of the velocity and the density.

(3) In the third method the velocity is determined by placing an obstruction in the air and by measuring the force exerted or the pressure generated at the obstruction.

Suppose we consider a column of air having a cross section equal to that subtended by the obstruction and a velocity *v* per sec. The mass of air impinging on the obstacle per sec. will be proportional to ρv and its momentum to ρv^2 . We know that force is equal to the rate of change of momentum, and since this column of air parts with its momentum to the obstacle, it follows that the force exerted or the pressure generated will be proportional to ρv^2 . This may be called "the density velocity squared method," or simply "the ρv^2 method."†

Now an aeroplane in flight derives its support from impressing a downward momentum on the air which comes within its influence. The mass of air which it engages depends directly on its velocity *v* and the density ρ of the air and is therefore proportional to ρv , and the velocity with which the air is driven downwards, the inclination of the machine being kept constant, is proportional to the velocity of the machine. The lift is therefore proportional to the product $v \times \rho v$, i.e., ρv^2 . Thus, the dynamical buoyancy of the air is proportional to ρv^2 . Instruments depending on the dynamical pressure

of the air may therefore be referred to as " ρv^2 instruments" or "dynamical buoyancy meters."

It is obvious that as the height increases and the density of the air decreases, the velocity must be increased to obtain the same buoyancy from the air. Instruments of this class will therefore act excellently as buoyancy meters, but will be deceptive as to speed unless the density of the air is obtained and the true velocity deduced from the reading of the instrument at that density. It should be borne in mind by pilots and designers that if a machine is travelling at a great altitude the inertia stresses caused by sharp turns or quick evolutions may be greater than expected, since the velocity is greater than would appear from the instrument reading.

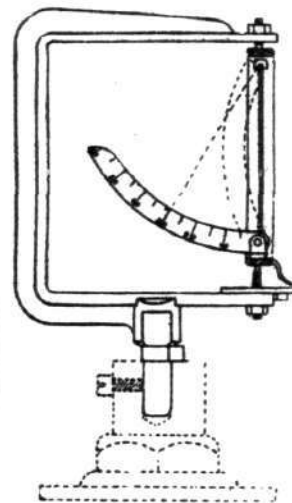
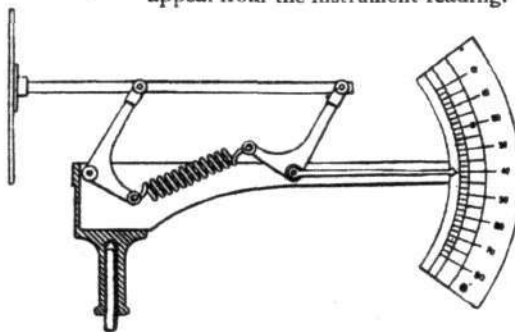


Fig. 1.—Maxim's air speed indicator. Fig. 2.—Scattergood's anemometer.

v Instruments.—(1) Instruments coming under the first category, such as helical vane instruments, have the advantage that they are useful as "logs" in navigation, since their readings are independent of the density of the air. If used for this purpose they should be provided with a counter to record the actual distance travelled. Thus arranged they would form an interesting and useful adjunct to the ordinary ρv^2 instrument. Instruments of the *v* type are not suitable for low velocities, but may be regarded as fairly accurate over the range of velocity of a flying machine. The variation of friction, due to air pressure on the vanes, which varies as the square of the velocity and the density, is however a small source of error, in view of the fact that the reading of the instrument should vary as the velocity only. In fluctuating winds an additional error is introduced by the inertia of the rotating parts making the mean reading a little high.

(2) Instruments of the Robinson cup type, in which cup vanes are mounted on the ends of radial arms projecting from a shaft which rotates about a vertical axis, appear to be difficult to class. The velocity of rotation would appear to be in part proportional to the difference in the dynamical pressure on opposite cups and in part proportional to the velocity of the wind. Experience has proved that the best approximation to the true velocity is obtained by multiplying the speed of the centre of the cups by a factor 2.2. This type of instrument appears to be regarded by the makers as of the *V* type.

ρv^2 Instruments.—(3) Instruments of the ρv^2 class always consist of two distinct parts, one at which the pressure is generated and the

* Paper read before the Aeronautical Society of Great Britain, at the Royal United Service Institution, on May 6th.

† The theory of the Pitot tube is as follows:—

The total energy *E* in unit mass of a fluid = the potential energy + the pressure energy + the kinetic energy.

$$E = h + \frac{p}{w} + \frac{v^2}{2g}$$

Where (in suitable consistent units) *h* = potential height of fluid. *p* = pressure. *w* = weight of a column of the fluid of unit cross section and height. *v* = velocity.

Now in the case under consideration the potential energy is not available and therefore *h* = 0.

$$\therefore E = \frac{p}{w} + \frac{v^2}{2g}$$

If the velocity and the kinetic energy are assumed zero, as is the case at the mouth of the Pitot tube,

$$\text{then } E = \frac{p}{w} \quad (1)$$

And if all the pressure energy is converted into kinetic energy

$$\text{then } E = \frac{v^2}{2g} + 2g \quad (2)$$

But the total energy is constant.

Eliminating *E* from (1) and (2)

$$\text{then } \frac{p}{w} + 2g = \frac{v^2}{2g} + 2g$$

$$\therefore \frac{p}{w} = \frac{v^2}{2g}$$

Let *h'* = the "head" of fluid corresponding with the pressure *p*

$$\text{then } h' = \frac{p}{w}$$

$$\therefore \frac{p}{w} = \frac{v^2}{2g} \quad (3)$$

If *h''* = head of water in tilting gauge corresponding to the head *h'* of the fluid.

ρ = density of fluid.

$\rho = \frac{w}{v} \therefore h' = h'' + \rho$. Substituting this value in (3).

$$\frac{v^2}{2g} = h'' + \rho \text{ or } v = \sqrt{2g h'' + \rho}$$

The density of air is generally taken as 0.0012.

If *h''* is measured in feet and *g* is taken equal to 32.18, then the velocity given by the above equation will be in ft. per sec.

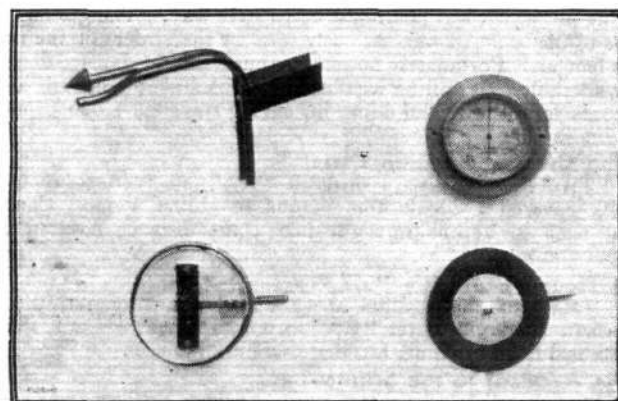


Fig. 3.—Head and Details of Clift's air-speed indicator.

other at which it is recorded. This class may be divided into two sub-classes.

(a) Devices in which the resistance of a plate or body in a current of air is measured mechanically.

(b) Devices in which the pressure generated on a body placed in the current is recorded on a manometer or equivalent device.

Type 3a.—Instruments shown in Figs. 1 and 2 are examples of type 3 (a). Fig. 1 shows Maxim's air speed indicator. In this device a circular disc is mounted so that its deflection is resisted by a spring and the amount of deflection is recorded on a dial. The dial may be graduated to record the velocity, since it varies with the resistance offered by the circular disc. Fig. 2, showing Scattergood's anemometer, illustrates another type in which the resistance is balanced by gravity. A plate is pivoted at its upper end and its inclination varies as the velocity of the wind. The quadrant may therefore be graduated to record the velocity.

In both these instruments, since the inertia varies as the square of the velocity, it follows that the mean reading will give the root mean square velocity which is as required. The friction at the joints, however, introduces a variable coefficient which will vitiate the accuracy of the device. In other examples of this type of device a sphere is suspended by a cord and the speed of the air determined by the deflection of the sphere.

In another method, which is often very useful in the laboratory, the resistance offered by a body in the current of air is weighed on a delicate balance. If this resistance has been carefully recorded over a range of speeds a very accurate reading of velocity can be obtained by means of this record.

Type 3b.—Instruments of type 3 (b) are much more generally used in accurate scientific work, owing to their great accuracy and to the fact that the parts which are placed in the air current may be very small. They consist of two parts.

3b (1) A tube for obtaining the dynamical pressure having its open end facing the wind and another tube for measuring the static pressure of the air.

3b (2) A manometer for measuring the difference in pressure between the dynamical and static tubes.

3b (1).—The dynamical or Pitot tube always consists of a tube with the open end facing the wind, but the static tube may be of various designs. In the simplest form, with the static tube embracing the dynamical tube, as described by Messrs. Jones and Booth,* the velocity is given by the equation

$$v = K \sqrt{2gh}$$

Where v is in feet per sec., g is the acceleration due to gravity = 32.18 approx., h is the difference of pressure in the two tubes in feet of air at the static temperature and pressure of the air in the tunnel, and K is a constant which may be assumed equal to unity.†

In other forms the static tube may be provided with a hood to decrease the pressure and to give a greater reading on the manometer, as in the R.A.F. tube and the Clift pattern, shown in Figs. 3 and 4, or it may have its axis at right angles to the current with a series of holes symmetrically placed around as in the Dines tube.

In these forms the velocity is given by the equation

$$v = K \sqrt{2gh}$$

Where K is a constant which is determined by comparison with a standard.

* *Aeronautical Journal*, July 1913.

† *Philosophical Magazine*, Vol. 21, Fry and Tyndall "On the Value of the Pitot Constant."

3b (2).—The pressure difference between the Pitot and the Static Pressure tube may be measured in various ways, as by—

(a) A liquid level gauge, such as the tilting gauge, described by Dr. Stanton,‡ or by the author,§ or it may be of the R.A.F. pattern designed by Mr. F. A. Short and described by Mr. Horace Darwin,|| or it may be of a U tube of the Roberts type.¶

(b) A cylindrical or bell float in an enclosed vessel. In this type the dynamic tube is usually placed in connection with the interior of the float and the static tube with the interior of the vessel containing the float. In the Dines arrangement the float is designed in such a way that the amount by which it is lifted is proportional to the velocity of the wind. The rise of the float is recorded by an indicating device.

(c) A U tube mounted on a balance so that a difference of pressure in the two limbs causes a flow of liquid which upsets the equilibrium of the balance.

(d) A delicate Bourdon gauge.

(e) A piston and spring gauge. It is difficult in this gauge to eliminate friction. The friction causes the reading to lag behind the true reading. The readings therefore have a hysteresis loop.

(f) An elastic diaphragm or chamber gauge.

Types (a), (b) and (c) are gravity controlled devices and are particularly suitable for use in the laboratory and for delicate work, and types (d), (e), (f) are independent of gravity and are more suitable for use in actual flight, where a reasonably accurate "sight" reading is required which is unaffected by changes of acceleration or by shaking. These instruments give a true mean reading if the tubes are sufficiently large to prevent friction and eddy current losses, since the inertia of the moving parts varies as the square of the velocity.

Gravity versus Spring Controlled Instruments.—An aeroplane in flight is continually subject to changes in acceleration in every direction. Now force equals mass \times acceleration. If, therefore, the masses of the movable parts of the recording instrument are considerable or are unbalanced, the readings will be inaccurate. In the case of the gravity controlled instruments it is clear that the readings will only be accurate when the machine is not subjected to an acceleration. For instance, if the machine is falling freely under gravity a small translational speed will give an infinitely large reading, and conversely if the machine is being accelerated upwards rapidly the velocity recorded will be much less than the actual velocity. In turning sharply the same result will be obtained. These effects are so well known that it is difficult to realise that it required a lengthy discussion in the technical Press to establish them, but it emphasises the need for keeping the primary principles to the front. A spring controlled instrument is free from many of the limitations of gravity controlled devices, although it is not so suitable for laboratory work.

The mechanism in the human middle ear (consisting of three semi-circular canals at right angles containing fluid), which gives us our "sense of balance" (Kinesthetic Sense), is obviously a gravity controlled one. It would therefore be desirable that the readings of the speed indicator should act as a check to the senses, rather than be subject to the same "illusions" due to accelerations. Obviously a spring controlled instrument fulfils this condition much better than a gravity controlled instrument.

‡ Proceedings, Institution of Civil Engineers, vol. clvi.

§ *Aeronautical Journal*, April, 1911.

|| *Aeronautical Journal*, July, 1913.

(To be concluded.)

AERONAUTICAL SOCIETY OF GREAT BRITAIN.

Official Notices.

Wilbur Wright Memorial Lecture.—The second "Wilbur Wright Memorial Lecture" will be delivered by Dr. R. T. Glazebrook, C.B., F.R.S., F.Ae.S., on "The Development of the Aeroplane," at the Royal United Service Institution, Whitehall, on Wednesday, May 20th, 1914, at 8.30 p.m.

† The Right Hon. Lord Sydenham, G.C.M.G., F.R.S., will preside.

On the evening preceding the meeting (viz., on May 19th) the Council will entertain the lecturer and other distinguished guests at a banquet at the Royal Automobile Club, Pall Mall, S.W., at 7.45 p.m. for 8 p.m.

Members are invited to purchase tickets for themselves or their friends at £1 1s. each, inclusive of wines, cigars, &c. Members desirous of contributing to the guarantee fund, which has been opened to defray the costs of official guests, may send subscriptions in addition to purchasing tickets.

Cheques should be made payable to Griffith Brewer, and sent to the Aeronautical Society, 11, Adam Street, Adelphi.

B. G. COOPER, Secretary.

Maurice Farman Visits Chalons.

ON Monday Maurice Farman, on one of the new type machines bearing his name, flew from Buc to Chalons, going by way of Meaux, Montmirail and Rheims.

T. Elder Hearn Loops the Loop.

AFTER a short period of special training at the Blériot school at Buc, T. Elder Hearn, the well-known music hall artist, looped the loop on Monday. He intends to attempt to fly from Paris to London in a few days on the Blériot machine which he has purchased.

Fast Flying on Anzani-Dep.

ON his Deperdussin waterplane, which is fitted with a 10-cyl. 85 h.p. Anzani motor, Issartier on Monday flew with a passenger from Bordeaux along the Garonne and the Dordogne to St. Andre de Cubzac, covering the distance of 45 kiloms. in 25 mins. In the afternoon he returned to Bordeaux.

Parachute Descents from Aeroplanes.

AT Nevers on Saturday, Mme. Cayac de Castella, by the aid of a parachute invented by her husband, descended from a Goupy biplane piloted by Pelletier.

FOREIGN AIRCRAFT NEWS.

A German Distance Record.

LIEUT. WENCHER, accompanied by two other officers, on a 100 h.p. military biplane last week, flew from Metz to Freiberg, a distance of 200 kiloms. which is claimed as a world's record for pilot and two passengers. The weight of the three officers was 259 kilogs., and in addition the machine carried 50 kilogs. of baggage and 180 litres of fuel.

Long Flight on a Vendome.

ON the 29th ult., Goffin on a Vendome monoplane, fitted with an E.J.C. motor, made a very satisfactory flight, lasting an hour and a half, above and around Chateaufort.

Testing New Farman Designs.

AT Buc on the 29th ult., Henry Farman was busy testing the new type landing chassis, while his brother Maurice carried out some trials with a 1914 Maurice Farman fitted with a new arrangement of all-enclosed nacelle which is giving very good results.

Farman Père Enjoys a Trip.

ON the 30th ult., Maurice Farman made a long trip, accompanied by his father, to Etampes, Dreux, and Tillieres, eventually returning to Buc, the run being made with no more incident than if it had been effected by the aid of a motor car.

A High-powered Voisin.

TESTS were carried out on the 1st inst. by Rugere with a Voisin biplane of large dimensions which has been built to the order of the pilot Mahieu. The machine is fitted with a 200 h.p. Clerget-Blin fixed motor.

Tests with a Rhone Motor.

A TWO-HOURS' test with a Rhone motor, having a cylinder capacity of 10'9 litres, was recently carried out in the laboratory of the Automobile Club of France. The effective h.p. given off was 88'6, the fuel consumption 244 grammes per h.p. hour, and the oil consumption 57 grammes per h.p. hour.

Legagneux Beats Audemars.

THE feature of the meeting held at Buc last Sunday afternoon was a series of matches between Legagneux and Audemars, the former on a Clerget-Nieuport and the latter on a Gnome-Morane. There were three items, a speed test, a pursuit race, and a landing test, and in each Legagneux was the victor. In the speed test his time for the 20 kiloms. was 10 mins. 11 secs., while Audemars took 12 mins., and in the pursuit race Legagneux covered the 15 kiloms.

in 8 mins. 1½ sec., beating Audemars by 1 min. ¼ sec. During the afternoon Audemars looped the loop, as also did the Comte de Larenty Tholozan on a Blériot, while Garros gave a display of fancy flying. The meeting terminated with a parachute descent from a Blériot piloted by Cuendet.

A Meeting at Juvisy.

THE chief event at the meeting arranged at Juvisy for Sunday afternoon was a 10 kilom. handicap. The eliminating race for biplanes resulted in Champel on his Anzani-engined biplane securing first place, with Vallier on an Anzani-Caudron second, while in the monoplane heat Jupin on a Bathiat was the only finisher. In the final Champel had an easy win. Jupin afterwards gave a display of looping, &c., while Champel carried a number of passengers.

Vidart Loops the Loop.

AT Etampes on Sunday last Rene Vidart looped the loop for the first time on a Deperdussin monoplane fitted with a Rhone motor. During a second flight he made fifteen successive loops.

The Schicht Prize.

AS announced in our last issue, Wittmann, on the Lohner-Arrow monoplane, with Austro-Daimler motor, was awarded the first prize in the Schicht competition, while the second prize was secured by the pilot who flew under the *nom de vol* of "Bareth" on a Lohner biplane, the only other machine to finish the complete itinerary.

Another German Loop.

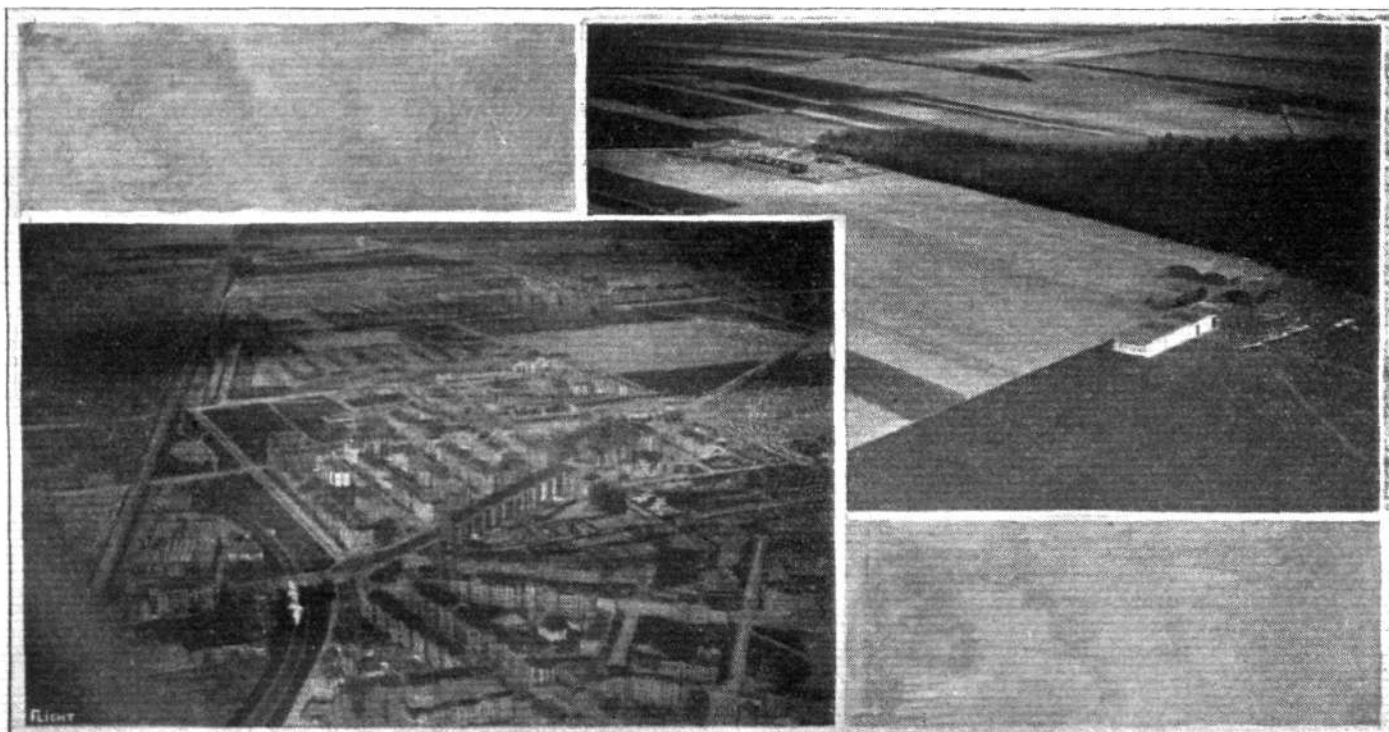
LAST week the well-known German constructor, Fokker, succeeded in looping the loop at Scherwin on a monoplane of the Morane type.

Fatality in Germany.

AFTER a fine flight from Doeberitz on the 1st inst., Lieut. Niemeier was landing at Halberstadt when his biplane was caught by a gust of wind and overturned. The passenger, Lieut. Mayer was killed through being crushed by the motor, while the pilot had both his arms broken and was otherwise seriously injured.

An Aeroplane Factory for Holland.

ACCORDING to the *Gazette of Holland* arrangements are being made for the establishment of a works in Holland for the construction of aeroplanes. A flying ground has been secured adjoining the aerodrome at Soestenberg, where Farman biplanes and Brouckere monoplanes will be built under licence. The Company will be under the management of M. Henri Wijnmalen.



Left: Leipzig from above, taken from a D.F.W. scouting biplane. Right: The D.F.W. works, which are situated on the historic battlefield of Leipzig, where, in 1813, Napoleon was defeated by the United forces of England, Germany, Austria and Russia. One wonders what would have been the issue of that famous battle had the contesting armies possessed a number of aeroplanes similar to those flying over the field regularly at the present day. At the D.F.W. works are employed, we understand, no fewer than 722 workmen, in addition to a staff of 56 engineers and office staff, whilst the works are capable of turning out machines at the rate of four or five a week.



A "D.F.W." scouting biplane, which is credited with a maximum speed of 106 to 110 miles per hour, and a minimum speed of 51 miles per hour. She will climb to an altitude of 3,500 ft. in about 6 mins.

Military Aviation in Holland.

At present the Dutch Army possesses four flying officers, but in the forthcoming estimates provision is to be made for the extension of this branch of the service by the acquisition of more machines. Aeroplanes are to be used as much as possible at any manoeuvres which may be held, and it is also proposed to carry out some flying exercises in connection with the Army and Navy in the Dutch East Indies.

Cross-Country Test for Sikorsky Giant.

It is stated from St. Petersburg that arrangements are being made for a race between the Sikorsky giant biplane and an express train from the Russian capital to Moscow. M. Sikorsky will pilot the aeroplane, while the train is to be driven by M. Shtshukin, Assistant to the Russian Minister of Communications.

Fatal Accident in California.

WHILE attempting to make a flight from Los Angeles to San Diego on Wednesday of last week, a machine piloted by Royston fell from a height of 700 feet at Dominguez. The pilot was killed instantly.



A "D.F.W." all-steel biplane, in which the only wood employed is that of the propeller. This machine, which was designed by Mr. Cecil Kny, the Technical Director, will be built in this country as soon as the new works at Richmond are completed. With a full load, including fuel for 5½ hours and two passengers, the machine has climbed to a height of 3,500 ft. in 4 mins. The engine is a 100 h.p. Mercedes, and the speed is 78.4 miles per hour. Inset is a view of the machine in flight.

Models

Edited by V. E. JOHNSON, M.A.

Two Interesting Model Types.

AMONGST this season's coming competitions will in all probability be found those in which the competitors will be compelled to submit models of the covered-in fuselage Canard type, and also in which twin tractor models will be eligible and permitted (as an experiment), to compete on equal terms with their single tractor relatives. In the case of the Canard type model there will be certain restrictions with respect to the maximum length and breadth of the fuselage in order to ensure the use of a fuselage and not a mere tube.

In view of this the accompanying photos, drawings, and particulars, kindly supplied us by Mr. A. B. Clark (Hon. Sec. South-Eastern Model Aero Club), of Mr. F. Plummer's models should prove especially interesting.

The Covered-in Fuselage Canard-type Model.—This machine was constructed about fourteen months ago. At first it was flown with the fuselage open, and very good flights were obtained. No actual record of the flights was kept, unfortunately, but, as far as memory serves one, the average distance flown was about 230 yards, after rising from the ground. Afterwards it was converted into a hydro with "quick-detachable" floats, and again good flights were made. Later on Mr. Plummer decided to encase or cover in the fuselage to observe the effects produced by such a course. The floats were therefore removed, and the land chassis fitted on again, as the prospect of a fuselage filled with water was not at all enticing.

The flights obtained—with the body or fuselage covered in—were much better than any made previously, the improvement being at least equivalent to a distance of 40 yards. The stability of the model was far better, both laterally and longitudinally. And, taking it all round, the enclosing of the body may be reckoned a distinct success, so much so that Mr. Plummer has no intention of again removing the model's clothes.

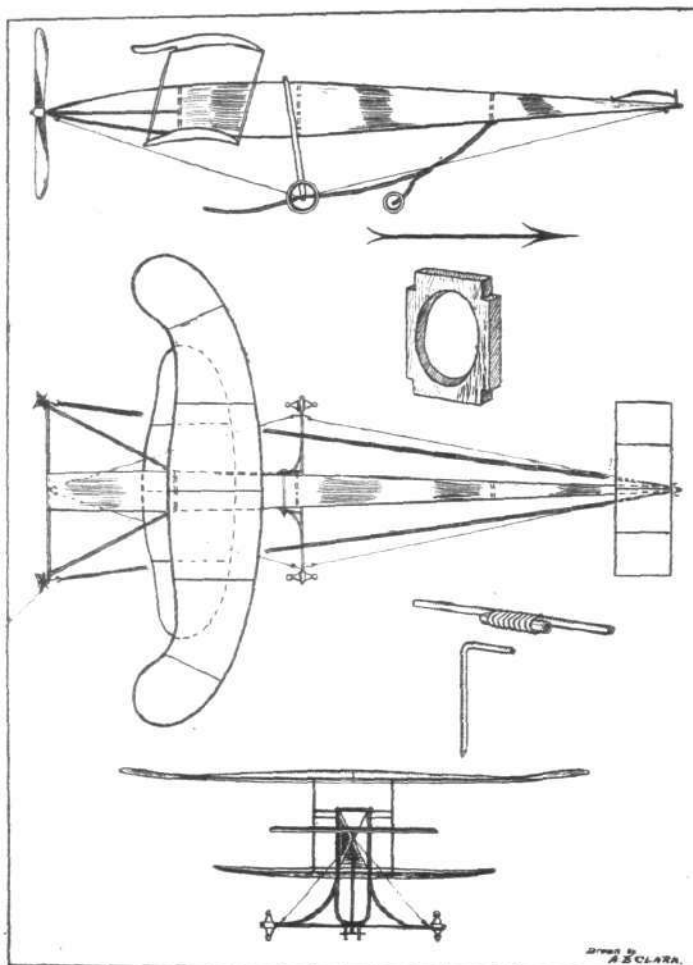
A general idea of the machine may be obtained from the accompanying scale drawings and photos.

The fuselage is 33 ins. in length, and is built up (a feature to be recommended) of four longitudinals of $\frac{1}{4}$ by $\frac{1}{8}$ in. silver spruce, brought to a point at the front, and forming a horizontal knife edge at the rear. These longitudinals are held apart by three "distance blocks" sawn from $\frac{1}{4}$ -in. thick whitewood or 3 ply-wood, see sketch for shape. The front block measures $1\frac{3}{4}$ by $\frac{1}{2}$ ins. over all, and is 10 ins. from the nose of the model. The middle block is another 10 ins. further back, and the overall dimensions of this are $2\frac{1}{2}$ by $1\frac{1}{2}$ ins. The third or last distance piece is $2\frac{1}{4}$ by 2 ins., and is situated $6\frac{1}{2}$ ins. from the propeller-bearing outrigger. In each case the dimensions are greatest as viewed from the side. The four-wheeled chassis and central skid is easily constructed from split bamboo, and is fairly obvious from the illustrations.

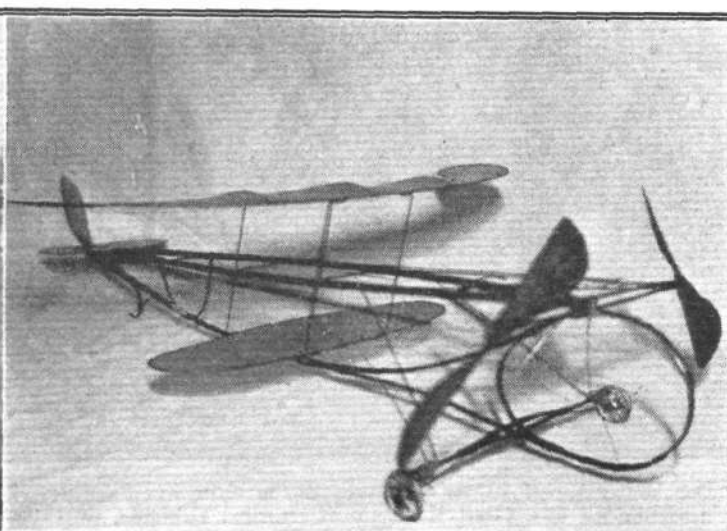
The main planes and elevator are made of 18 s.w.g. piano wire in the usual way. The upper plane has a maximum span of 25 ins.,

and is $5\frac{1}{2}$ ins. wide at the middle. The lower plane has a maximum span and chord of 15 ins. and $5\frac{1}{2}$ ins. respectively.

These planes are not rigidly connected to each other, but are joined by piano wire inter-plane struts which fit into small pieces



Mr. F. Plummer's (S.E.M.Ae.C.) canard biplane with covered-in fuselage.



Mr. F. Plummer, of the South-Eastern Model Ae.C., with his enclosed body canard biplane. On the right Mr. Plummer's twin tractor biplane. The skid construction should be noted.

of brass "by-pass" tubing which are soldered to the leading and trailing edge of each plane. A detailed sketch is shown. The tips of the upper main plane are swept back 2 ins. and have a slight negative angle of incidence. The elevator is rectangular, and measures 9 ins. by 3. By means of a piece of cycle-spoke and two small nuts to fit, the angle is quickly altered.

The twin propellers are 9 ins. in diameter, and have a pitch of 18 ins. They are each driven by 6 strands of $\frac{1}{4}$ -in. strip rubber. The probable duration is 35 to 40 secs.

Competitions for Season 1914.

We have received the following communication from Mr. O. Hamilton, Junr. (Hon. Sec., Stony Stratford and District Kite and Model Club). "I should be glad to add my quota to the discussion on the above subject. I feel it is one which will stand a great deal of debate before a proper and satisfactory programme of events could be arranged. It is pleasing to note the development of the more scientific side, but there is a possibility that our more advanced London friends may forget their country cousins somewhat, more especially those who are unable to spend the time they would like upon the subject and are therefore not so forward as the clubs nearer the mother club, the K. and M.A.A. [Such clubs must, of course, organise special competitions to suit their own immediate needs.] The intelligent public fail to understand the principles of the present-day model, since they cannot see its prototype in full-size aspect, as in the case of a model racing yacht, which, if produced in full-sized form from the model, would possibly show the absurdity; in the case of the aero model the essential differences are far more apparent. [They are not only apparent but very real.] Mr. W. E. Evans states that the Canard type model has received its death-blow [in its present form] for scientific work. This is perhaps a somewhat tall order, as I personally think this is still adaptable to the requirements of our more staid model workers. Hence I think it ought to be included in a more fruitful and wider field of research. [By all means on certain lines.] Examining the various proposals brought forward in detail, I think we owe our Paddington friends a large debt for their suggestion for a competition for types *à la* Dunne, because there is at once attaching a new problem for automatic stability and constructional ideas. Now, if I may, I should like to review your suggestions in the issue of April 18th.

(1) This should certainly be the case, except in the case of juniors or beginners with r.o.g. models.

(2) This is excellent, one of our members is experimenting with a motor that would be adaptable to such a type, and up to the present the results are decidedly encouraging. [Adopted as: the length of the rubber-motor shall not exceed the span, a quite satisfactory result.]

(3) That three longitudinals [at least] should be used for tractors is very necessary; nothing looks so ugly as the single stick tractor r.o.g.

(4) This suggestion is most progressive, but I think that the 8-oz. twin hydro should be encouraged for early experiment, as this gives much valuable data for such questions as flotation stability and the position of the floats relative to the centre of gravity of the machine, when in flight [none of the suggestions put forward were for early experiment, but for standard competitions. Save when experimenting with a new type, hydros under 1 lb. weight are useless].

(5) A most sound and progressive suggestion, and one that all clubs should develop to some degree.

(6) Another good suggestion, *i.e.*, a controllable motor.

(7) This class is, I think, most necessary, as it will assist in possibly helping to find data for a successful full-size machine of this type.

(8) This is very good, but the judging for design, &c., in a large competition would take a lot of time and reduce the number of trials.

(9) This is also a sound suggestion, and would prevent the design of a mere pot-hunting model.

(10) This is certainly necessary, and arrangement could be made.

(11) This is a very good suggestion, but rather premature, I fear, unless some light alloy can be found for the motor parts.

In addition to the above sound suggestions, I venture to bring forward a few of my own:—

1. That in all competitions where possible not less than two flights be made, preferably three, the result to be the average of these. [Three flights, the average to be taken, will be the rule.] This has already been suggested in your columns, but I see no mention of it in any of the latter suggestions, and I feel I must draw attention to it because we have used it with such success in all our competitions but one, and find it gives a truer indication of a machine's possibilities and efficiency.

2. That some clause or rule in the programme of the events demands a respectable chassis to be fitted to all r.o.g. models and hydros. This is very necessary, as most chassis are conspicuous only by their absence. Speaking personally, I have not done much with r.o.g. models owing to lack of time to study the chassis question; two straight wires and a pair of wheels does not seem to me to be sufficient.

3. That a competition be introduced for steering and stability or various model types.

4. That a surface rating be used having a higher unit ratio than the one used at Olympia [4 oz. per sq. foot for monoplanes and 3 oz. for biplanes]. That a qualifying test should be a combination of both distance and duration, so regulated that the qualifying machines are of an all-round nature; this would be accomplished by suggestion No. 1.

5. That the stability of the model be noted whilst gliding to earth, motor run out. This would be a more effective guide to the relative stability of different plane sections."

[Practically speaking, all the principal points raised by our correspondent will be found to have been effectively dealt with by the Advisory Council of the K. and M.A.A. when their programme for this season's competitions is published.]

Proposed Junior Model Aero Club for Hove.

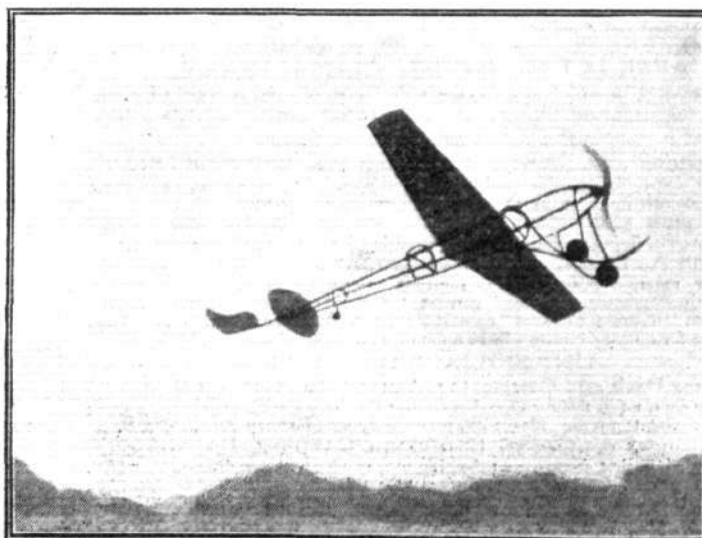
Mr. J. J. Allen (11, Brooke Street, Hove) will be glad to hear from anyone interested in the above.



KITE AND MODEL AEROPLANE ASSOCIATION

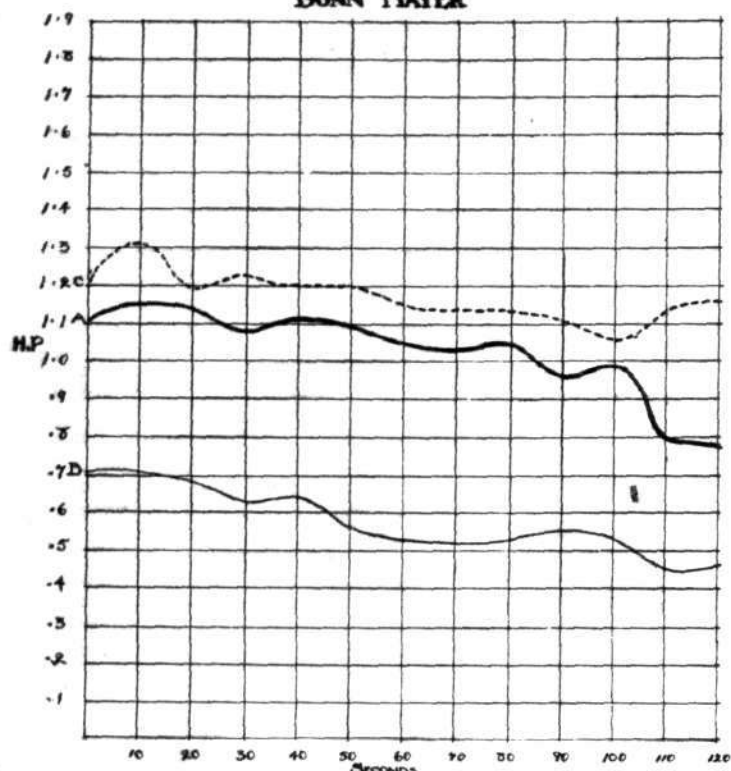
Official Notices.

International Aero Exhibition. Official Results of Engine Brake Tests.—The last of the competitions held in connection with the above Exhibition, for prizes offered by the Royal Aero Club, took place at the East London College, Mile End Road, on April 28th. The judges in this class were Professor J. T. Morris, M.I.E.E., Head of the Electrical Engineering Department, and



LIVERPOOL AERO RESEARCH CLUB.—On the left the trophy to be awarded in connection with the Club's Exhibition. On the right Mr. G. H. Kilshaw's latest tractor model just rising off; span 47 ins., length 48 ins.

BONN MAYER



Dr. A. P. Thurston, D.Sc., A.F.A.E.S., Chairman of the Research Committee K. and M.A.A., and Head of the Aeronautical Laboratory of the College. These gentlemen conducted the tests, the annexed charts showing the results of the trials, which were made with a Horne's tachometer with a 1,000 to 4,000 range. The weights of the engines, with fuel, &c., for a 2-minute run were as follows: Mr. Mayer's Bonn Mayer—Weight of engine and carburettor, 4 lbs. 6½ ozs.; battery (accumulator), 10 ozs.; tank and petrol for run, 1½ ozs.; coil, 10½ ozs.; total, 5 lbs. 12½ ozs. Mr. Fearn's Bonn Mayer—Weight of engine, 6 lbs. 15 ozs.; carburettor, pipes, &c., 15 ozs.; battery, 15 ozs.; coil, 10½ ozs.; total, 9 lbs. 7½ ozs. Mr. Mayer's engine gave the best results, and he, therefore, wins the £5 prize. The following are the results of weight per horsepower: Mr. Mayer's, 5.02 lbs. per H.P.; Mr. Fearn's, 7.29 lbs. per H.P. Mr. Pratt entered a steam-driven motor, viz., a 6-cyl. coil flash boiler, pump fed, 16 in. diam. special air brake, but this was withdrawn after two attempts on account of pump leaking.

Aeronautical Exhibition in Germany.—A Model Section is being organized in connection with the Aero Exhibition and the Prince Henry Flight at Frankfurt from May 17th to 21st, and the organizers hope that, in spite of the short notice, some English aeromodelists will send out models for our German friends to see. Exhibitors will have to pay the carriage out, and the organizers will pay carriage on return journey. All models must be sent addressed: Model Exhibit, Ing. Oskar Ursinus, "Flugsport," Frankfurt-am-Main, and must be dispatched by the 14th.

Programme for Season.—The various committees have now drawn up the rules, and it is hoped that members and friends will endeavour to obtain advertisements for same, so as to reduce the cost of printing the edition. The charges are: Whole page £2, half page 25s., quarter page 15s., 1 in. by 5 in. 10s.

Gift of Trophy.—The British Petroleum Co. have presented the Association with a Trophy for the International Meeting; it will be known as the "Shell Trophy." The Council desire to thank the donors for their gift, and hope that others interested in the development of aviation will come forward and subscribe to the International Fund.

27, Victory Road, Wimbledon.

W. H. AKEHURST, Hon. Sec.

AFFILIATED MODEL CLUBS DIARY.

CLUB reports of chief work done will be published monthly for the future. Secretaries' reports, to be included, must reach the Editor on the last Monday in each month.

Leytonstone and District Aero Club (64, LEYSPRING ROAD).

MAY 10TH, flying Wanstead Flats, 6.30 a.m. At 10.30 a.m., twin-screw duration competition. May 17th, tractor duration competition.

Paddington and Districts (77, SWINDERBY ROAD, WEMBLEY).

MAY 9TH, flying at Sudbury. Competition for silver and bronze medals.

Sheffield Ae.C. (41, CONISTON ROAD, ABBEYDALE, SHEFFIELD).

MAY 12TH, 8 p.m., general meeting at Broomhead's, Leopold Street. May 16th, "tractor biplanes" contest for M. D. Manton's silver medal. May 30th, "hydro-aeroplanes" contest for the President's challenge cup. Time and place for above contests will be announced at general meeting.

UNAFFILIATED CLUBS.

Finsbury Park and District (32, ASHLEY RD., CROUCH HILL, N.)

MAY 9TH, r.f.g. tractor duration contest Finsbury Park kite ground, 4 p.m.; practice flying at 3 p.m. May 16th, practice flying Finsbury Park, 3-6 p.m.

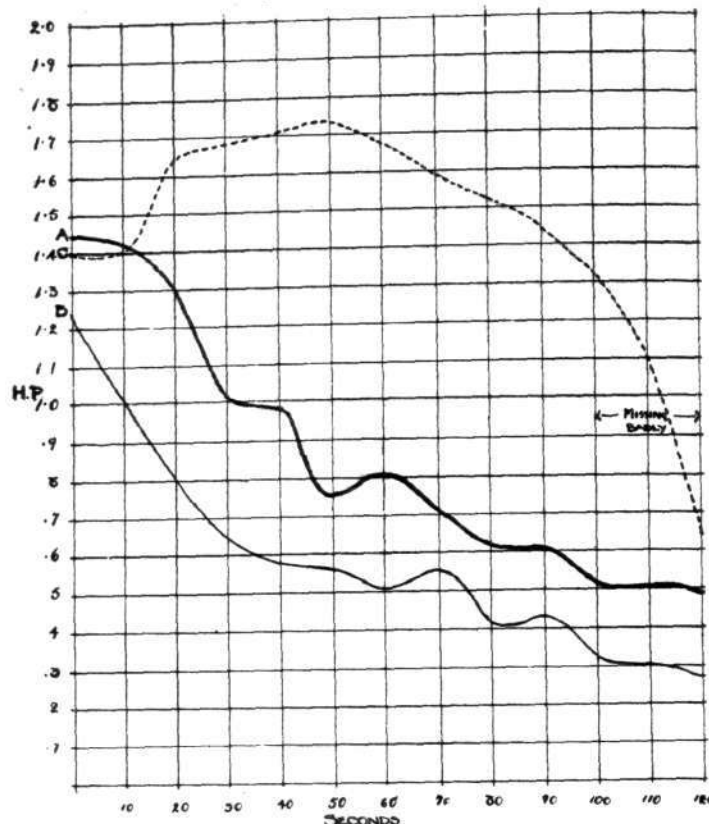
Ilford Model Ae.C. (83, ENDSLEIGH GARDENS, ILFORD).

MAY 10TH, first competition meeting at 9.15 sharp at aerodrome, Hog Hill, Hainault Forest, Chigwell Row, near "Green's." Competitors who are not present at the judge's flag at 9.15 punctually will be disqualified. Most importance will be given to "tractor events."

S. Eastern Model Ae.C. (1, RAILWAY APPROACH, BROCKLEY).

USUAL flying meetings this week-end at the club's various grounds. Members are particularly requested to make a start on models intended for the next "trophy" competition, instead of leaving them until the last moment.

FEARN'S BONN MAYER



"Tel" Indicator on Schneider Cup Winner.

THE Sopwith seaplane on which Pixton won the Schneider Cup was fitted with a "Tel" revolution indicator, and, in writing to the Haslar Telegraph Works, the Sopwith Co. state that during the race it acted up to its splendid reputation.



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Aeronautical Patents Published.

Applied for in 1913.

Published April 23rd, 1914.

7,478. J. WULFING. Airships.
24,035. SOC. ANON. DES AEROPLANES ROBERT SAVARY. Wheels.

Published April 30th, 1914.

8,594. C. H. M. A. ALDERSON. Hydro-aeroplanes.
9,851. W. W. NOBBS AND A. J. THOMAS. Framework of aircraft.
13,367. J. HILL. Vessels for navigation in air or on water.

Published May 7th, 1914.

6,483. A. TOUSSANT AND G. LEPIÈRE. Aeroplanes.
9,181. E. P. F. A. COURSIN. Sighting apparatus for aeroplanes.
9,355. NEUFELDT AND KUHNKE AND GES. FÜR NAUTISCHE INSTRUMENTE. Hydro-aeroplanes.
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